

National Grid SA-COA **PRODUCTION FILE**

Contractor : ABB Contracting Co.

Project : SS 8709- 132/13.8kV in Alkharj City

Contract No : 11131113/00

Substation : 8709

Subject : 132/13.8kV AVC Panel +AVC

ABB



POWER SYSTEMS NETWORK MANAGEMENT
PROTECTION AND SUBSTATION AUTOMATION SYSTEMS
WBS NO: S-13020

ABB AUTOMATION COMPANY LTD.,
414, AL-KHARJ ROAD
SECOND INDUSTRIAL CITY
RIYADH-11383 K.S.A

CONTRACTOR : ABB Contracting Company
CLIENT : National Gridsa
PROJECT : CONSTRUCTION OF NEW 132/13.8kV SS 8709 IN AL-KHARJ CITY
SUBSTATION : S/S 8709
CONTRACT NO. : 11131113/00
TITLE : Assembly Drawing – +AVC (GT1,GT2,GT3)

AS-BUILT BY _____ DATE _____ CONTRACT NO. **11131113/00** JOB ORDER NO. **S-13020**

02	13 49	FACTORY ASBUILT	DRAWN BY RIZ CHECKED BY JKR
01	13 25	AS PER SEC COMMENT	DATE STARTED 04.02.2013 DATE COMPLETED _____
00	13 06	FOR APPROVAL	OPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC
REV. NO.	DATE	DESCRIPTION	

COVER SHEET

132/13.8KV (GT1,GT2,GT3) AVC PANEL
S/S 8709 - 132/13.8KV IN AL-KHARJ CITY
RIYADH SAUDI ARABIA

الشركة الوطنية لنقل الكهرباء



نقل الكهرباء
National Grid sa

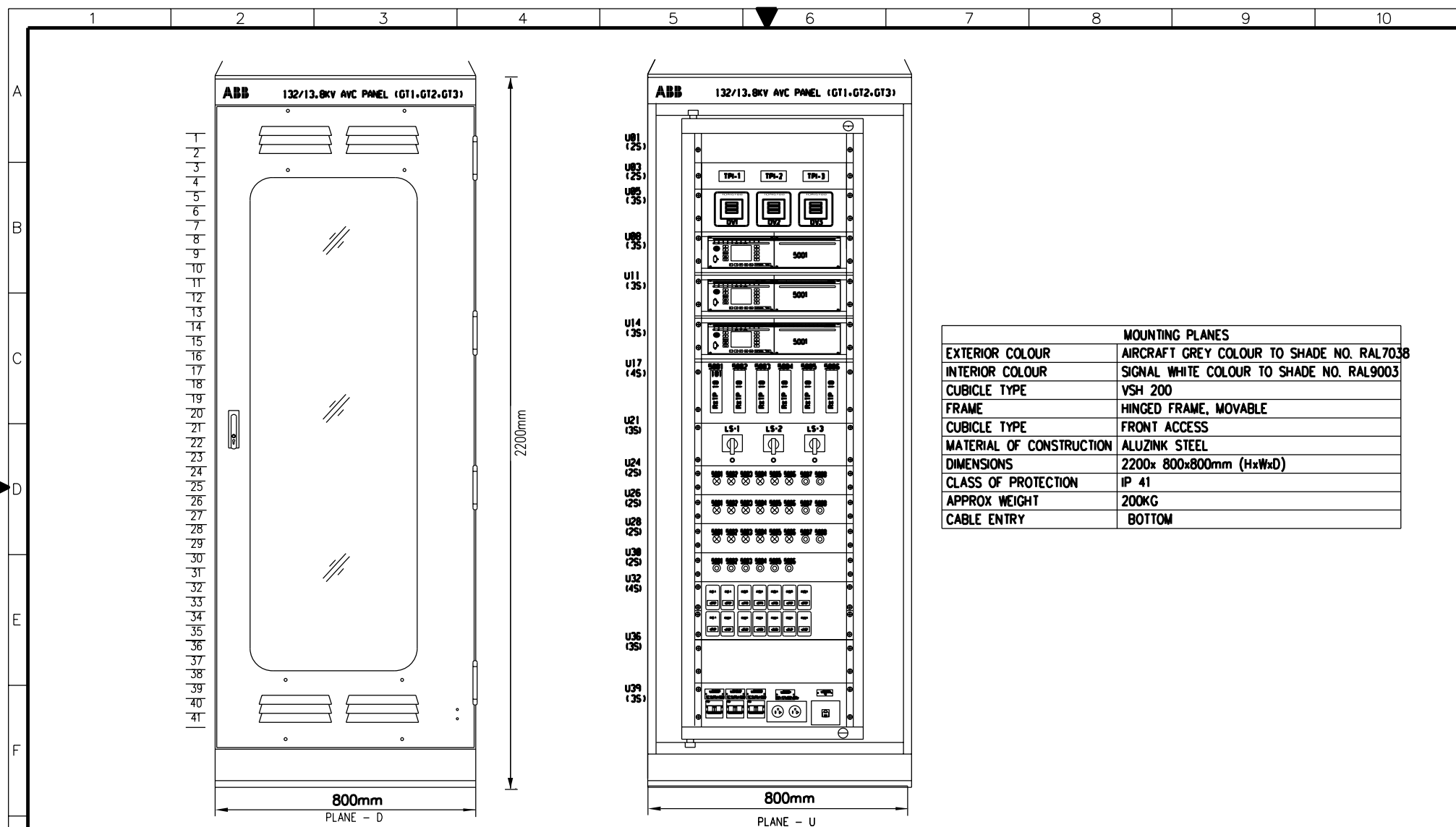
INDEX	PLANT NO.	DRAWING NUMBER	SHEET NO.	REV. NO.
-	C421	CD-322935	SHT CONT. 000 001	02

NG/D2-D (2012/01)

DMS

VECTOR

NGD200



MOUNTING PLANES	
EXTERIOR COLOUR	AIRCRAFT GREY COLOUR TO SHADE NO. RAL7038
INTERIOR COLOUR	SIGNAL WHITE COLOUR TO SHADE NO. RAL9003
CUBICLE TYPE	VSH 200
FRAME	HINGED FRAME, MOVABLE
CUBICLE TYPE	FRONT ACCESS
MATERIAL OF CONSTRUCTION	ALUZINK STEEL
DIMENSIONS	2200x 800x800mm (HxWxD)
CLASS OF PROTECTION	IP 41
APPROX WEIGHT	200KG
CABLE ENTRY	BOTTOM

AS-BUILT BY _____ DATE _____ CONTRACT NO. **11131113/00** JOB ORDER NO. **S-13020**

02	13 49	FACTORY ASBUILT
01	13 25	AS PER SEC COMMENT
00	13 06	FOR APPROVAL
REV. NO.	DATE	DESCRIPTION

DRAWN BY **RIZ** CHECKED BY **JKR**

DATE STARTED **04.02.2013** DATE COMPLETED _____

OPRG. DEPT. **CTPD** ENG. DEPT. **AUT-PSAC**

ASSEMBLY DRAWING

132/13.8KV (GT1,GT2,GT3) AVC PANEL

S/S 8709 - 132/13.8KV IN AL-KHARJ CITY

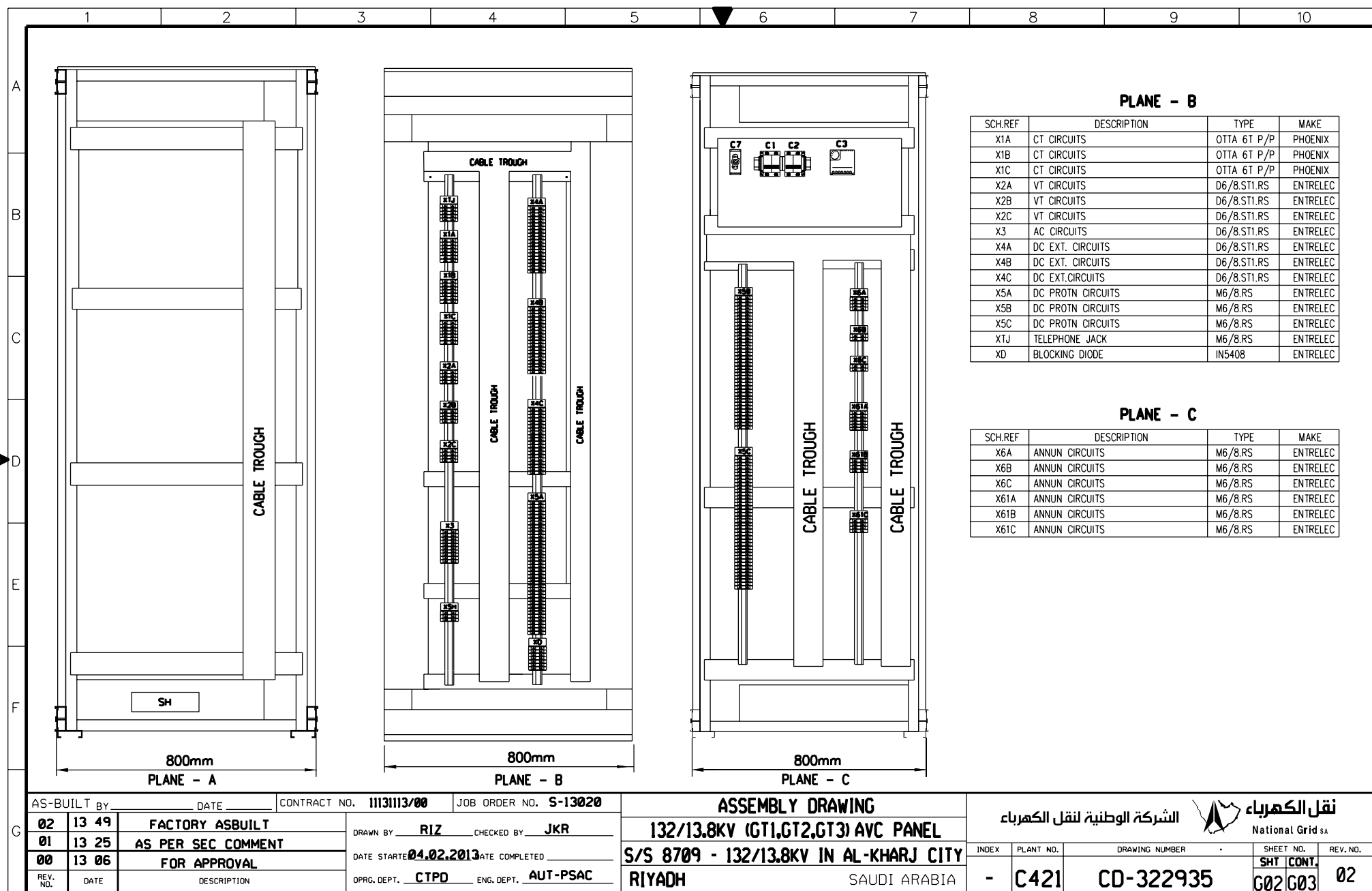
RIYADH SAUDI ARABIA

الشركة الوطنية لنقل الكهرباء

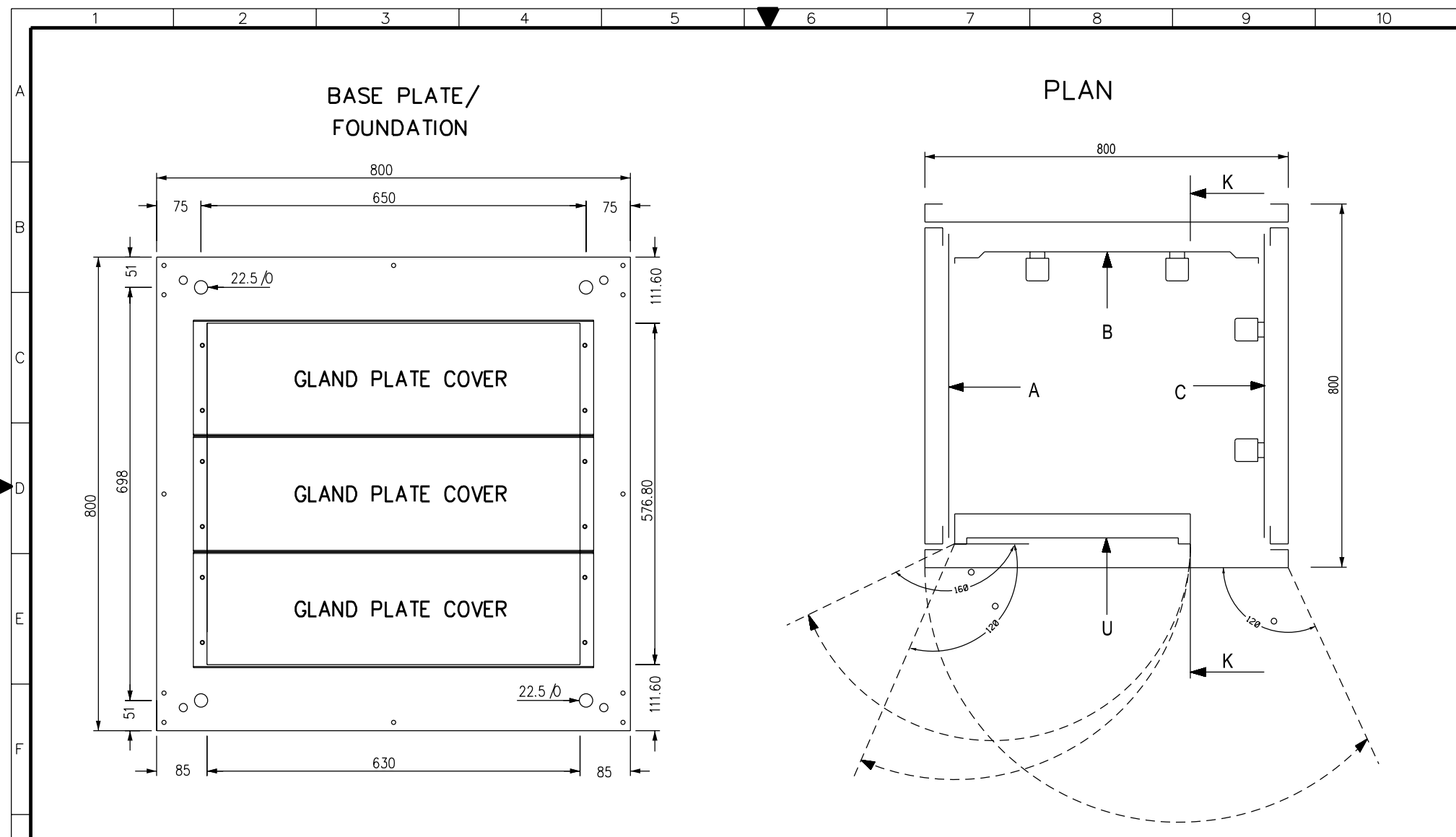


National Grid SA

INDEX	PLANT NO.	DRAWING NUMBER	SHEET NO.	REV. NO.
-	C421	CD-322935	SHT CONT.	02



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AS-BUILT BY _____ DATE _____ CONTRACT NO. **11131113/00** JOB ORDER NO. **S-13020**

02	13 49	FACTORY ASBUILT
01	13 25	AS PER SEC COMMENT
00	13 06	FOR APPROVAL
REV. NO.	DATE	DESCRIPTION

DRAWN BY RIZ	CHECKED BY JKR
DATE STARTED 04.02.2013	DATE COMPLETED _____
OPRG. DEPT. CTPD	ENG. DEPT. AUT-PSAC

ASSEMBLY DRAWING
132/13.8KV (GT1,GT2,GT3) AVC PANEL
S/S 8709 - 132/13.8KV IN AL-KHARJ CITY
RIYADH SAUDI ARABIA

الشركة الوطنية لنقل الكهرباء		National Grid sa	
INDEX	PLANT NO.	DRAWING NUMBER	SHEET NO.
-	C421	CD-322935	G03 G04
			REV. NO. 02

	1	2	3	4	5	6	7	8	9	10
A										
B										
C										
D										
E										
F										
G										

TOP VIEW FOR EARTHING BAR

U PLANE TOP LABEL

+ AVC	132/13.8KV	AVC PANEL (GT1,GT2,GT3)
⊗		⊗

800

28

U PLANE BOTTOM LABEL

⊗		⊗
ABB AUTOMATION CO. LTD		

800

28

MANUFACTURING LABEL

ABB ABB Automation Co.Ltd.	
PROJECT	: National Grid SA S/S 8709
ORDER REFERENCE	: 2875 RF S13020
YEAR OF MANUFACTURE:	2013
PANEL NO.	: +AVC
DRAWING NO.	: S13020-CD-322936
SPECIFICATION	: 3I-TMSS-01.REV.0
MADE IN THE KINGDOM OF SAUDI ARABIA	

AS-BUILT BY _____ DATE _____		CONTRACT NO. 11131113/00	JOB ORDER NO. S-13020	ASSEMBLY DRAWING		نقل الكهرباء الشركة الوطنية لنقل الكهرباء National Grid sa	
02	13 49	FACTORY ASBUILT		132/13.8KV (GT1,GT2,GT3) AVC PANEL			
01	13 25	AS PER SEC COMMENT		S/S 8709 - 132/13.8KV IN AL-KHARJ CITY			
00	13 06	FOR APPROVAL		RIYADH SAUDI ARABIA			
REV. NO.	DATE	DESCRIPTION		OPRG. DEPT. CTPD	ENG. DEPT. AUT-PSAC	INDEX -	PLANT NO. C421
						DRAWING NUMBER CD-322935	SHEET NO. G04 L00
						REV. NO. 02	



POWER SYSTEMS NETWORK MANAGEMENT
PROTECTION AND SUBSTATION AUTOMATION SYSTEMS
WBS NO: S-13020

ABB AUTOMATION COMPANY LTD.
414, AL-KHARJ ROAD
SECOND INDUSTRIAL CITY
RIYADH-11383 K.S.A

CONTRACTOR : ABB Contracting Company
CLIENT : National Gridsa
PROJECT : CONSTRUCTION OF NEW 132/13.8kV SS 8709 IN AL-KHARJ CITY
SUBSTATION : S/S 8709
CONTRACT NO. : 11131113/00
TITLE : LIST OF APPARATUS + AVC (GT1,GT2,GT3)

AS-BUILT BY _____ DATE _____ CONTRACT NO. **11131113/00** JOB ORDER NO. **S-13020**

02	13 49	FACTORY ASBUILT
01	13 25	AS PER SEC COMMENT
00	13 06	FOR APPROVAL
REV. NO.	DATE	DESCRIPTION

DRAWN BY **RIZ** CHECKED BY **JKR**

DATE STARTED **04.02.2013** DATE COMPLETED _____

OPRG. DEPT. **CTPD** ENG. DEPT. **AUT-PSAC**

COVER SHEET

132/13.8KV (GT1,GT2,GT3) AVC PANEL
S/S 8709 - 132/13.8KV IN AL-KHARJ CITY
RIYADH SAUDI ARABIA

الشركة الوطنية لنقل الكهرباء



INDEX	PLANT NO.	DRAWING NUMBER	SHEET NO.	REV. NO.
-	C421	CD-322935	SHT L00 CONT. L01	02

NG/D2-D (2012/01)

DMS

VECTOR

NGD200

	1	2	3	4	5	6	7	8	9	10
A	SR. NO.	GA. REF.	SCH. REF.	D E S C R I P T I O N		SHEET. NO.	QTY.	TYPE	MAKE	ORDERING INFORMATION
				PANEL +AVC ACCOMMODATING THE FOLLOWING:						
	1	U03.5001	TPI-1	TAP POSITION INDICATOR (19 TAPS)		221	3		FAGET	* SUPPLIED BY
		U03.5002	TPI-2	INPUT : 4-20mA		222				TRAFO MAF.
		U03.5003	TPI-3	AUX.VOLTAGE : 127V DC		223				
B	2	U05.5001	DV1	DIGITAL MULTIFUNCTION METER		221	3	ION6200	SCHNEIDER	M6200 A0 A000A0A0R
		U05.5002	DV2	PT RATIO : 0-120V (13.8KV/3/120/3)		222				+P620 PB
		U05.5003	DV3	FREQUENCY : 45 TO 65 HZ		223				
				ACCURACY CLASS : 0.2						
				AUX.VOLTAGE : 100-300V DC						
C	3	U08.5001	90-1	AUTOMATIC VOLTAGE REGULATING RELAY		498	3	TAPCON 260	MR	TAPCON 260
		U11.5001	90-2	VOLTAGE LEVEL SETTING : 85V TO 140V OF Un IN STEPS OF 0.1V,						
		U14.5001	90-3	BANDWIDTH : 0.5-9% Un IN STEPS 0.01%						
				O/C BLOCKING 50 TO 210 %						
				U/V BLOCKING - 60 TO 100%						
				O/V DECTION - 100 TO 140%						
D	4	U17.5001	TS-1	TEST SWITCH FOR AVC RELAY		221	6	RTXPI8	ABB	RK 926 115-AD
		U17.5002	TS-2			222				
		U17.5003	TS-3			223				
		U17.5004	TS-DV1	TEST SWITCH FOR DIGITALVOLTMETER		221				
		U17.5005	TS-DV2			222				
		U17.5006	TS-DV3			223				
E	5	U21.5001	LS-1	SELECTOR SWITCH FOR AVC LOCAL-SUPERVISORY		235	3	R20 2/4	COMELECTRIC	R193L-204_27-07
		U21.5002	LS-2	2 POSITION, 4 STACKS		335				
		U21.5003	LS-3			435				
F	6	U24.5001	L01	INDICATION LAMP FOR AVC IN LOCAL		233	3	ML1-100R	ABB	1SFA 611 400 R1001
		U26.5001	L07	LENS :RED		333		MCBH-003		1SFA 611 605 R1400
		U28.5001	L13	LED RATING :110-130V,4-6mA		433		KA2 2141		1SFA 616 921 R2141

AS-BUILT BY	DATE	CONTRACT NO.	11131113/00	JOB ORDER NO.	S-13020	LIST OF APPARATUS		الشركة الوطنية لنقل الكهرباء		نقل الكهرباء	
02	13 49	FACTORY ASBUILT	DRAWN BY	RIZ	CHECKED BY	JKR	132/13.8KV (GT1,GT2,GT3) AVC PANEL	National Grid sa			
01	13 25	AS PER SEC COMMENT	DATE STARTED	04.02.2013	DATE COMPLETED		S/S 8709 - 132/13.8KV IN AL-KHARJ CITY				
00	13 06	FOR APPROVAL	OPRG. DEPT.	CTPD	ENG. DEPT.	AUT-PSAC	RIYADH	SAUDI ARABIA			
REV. NO.	DATE	DESCRIPTION					INDEX	PLANT NO.	DRAWING NUMBER	SHEET NO.	REV. NO.
							-	C421	CD-322935	L01	02

	1	2	3	4	5	6	7	8	9	10
A	SR. NO.	GA. REF.	SCH. REF.	D E S C R I P T I O N		SHEET. NO.	QTY.	TYPE	MAKE	ORDERING INFORMATION
	7	U24.5002	L02	INDICATION LAMP FOR AVC IN SUPERVISORY		233	3	ML1-100Y	ABB	1SFA 611 400 R1001
		U26.5002	L08	LENS :YELLOW		333		MCBH-003		1SFA 611 605 R1400
		U28.5002	L14	LED RATING :110-130V,4-6mA		433		KA2 2143		1SFA 616 921 R2143
B	8	U24.5003	L03	INDICATION LAMP FOR OL TC OUT OF STEP		233	3	ML1-100B	ABB	1SFA 611 400 R1001
		U26.5003	L09	LENS :BLUE		333		MCBH-003		1SFA 611 605 R1400
		U28.5003	L15	LED RATING :110-130V,4-6mA		433		KA2 2144		1SFA 616 921 R2144
C	9	U24.5004	L04	INDICATION LAMP FOR OL TC TAP CHANGER IN PROGRESS		233	3	ML1-100R	ABB	1SFA 611 400 R1001
		U26.5004	L10	LENS :RED		333		MCBH-003		1SFA 611 605 R1400
		U28.5004	L16	LED RATING :110-130V,4-6mA		433		KA2 2141		1SFA 616 921 R2141
D	10	U24.5005	L05	INDICATION LAMP FOR AUTO		233	3	ML1-100Y	ABB	1SFA 611 400 R1001
		U26.5005	L11	LENS :YELLOW		333		MCBH-003		1SFA 611 605 R1400
		U28.5005	L17	LED RATING :110-130V,4-6mA		433		KA2 2143		1SFA 616 921 R2143
E	11	U24.5006	L06	INDICATION LAMP FOR MANUAL		233	3	ML1-100R	ABB	1SFA 611 400 R1001
		U26.5006	L12	LENS :RED		333		MCBH-003		1SFA 611 605 R1400
		U28.5006	L18	LED RATING :110-130V,4-6mA		433		KA2 2144		1SFA 616 921 R2144
F	12	U24.5007	PB1	PUSH BUTTON FOR OLTC RAISE		235	3	MP1-10B	ABB	1SFA 611 100 R1006
		U26.5007	PB3	BUTTON COLOUR :BLACK		335		MCBH-11		1SFA 611 605 R1111
		U28.5007	PB5	CONTACT DATA :1NO + 1NC		435				
	13	U24.5008	PB2	PUSH BUTTON FOR OLTC LOWER		235	3	MP1-10B	ABB	1SFA 611 100 R1006
		U26.5008	PB4	BUTTON COLOUR :BLACK		335		MCBH-11		1SFA 611 605 R1111
		U28.5008	PB6	CONTACT DATA :1NO + 1NC		435				
	14	U30.5001	PBES-1	PUSH BUTTON FOR EMERGENCY STOP		237	3	MP1-10B	ABB	1SFA 611 100 R1006
		U30.5003	PBES-2	BUTTON COLOUR :BLACK		337		MCBH-11		1SFA 611 605 R1111
		U30.5005	PBES-3	CONTACT DATA :1NO + 1NC		437				
	15	U30.5002	LT1	LAMP TEST BUSH BUTTON		236	3	MP1-10B	ABB	1SFA 611 100 R1006
		U30.5004	LT2	AUX VOLTAGE :110V-125V DC		336		MCBH-11		1SFA 611 605 R1111
		U30.5006	LT3	CONTACT DATA :1NO+1NC		436				

AS-BUILT BY _____ DATE _____		CONTRACT NO. 11131113/00		JOB ORDER NO. S-13020		LIST OF APPARATUS 132/13.8KV (GT1,GT2,GT3) AVC PANEL S/S 8709 - 132/13.8KV IN AL-KHARJ CITY RIYADH SAUDI ARABIA		الشركة الوطنية لنقل الكهرباء نقل الكهرباء National Grid sa					
02 13 49 01 13 25 00 13 06		FACTORY ASBUILT AS PER SEC COMMENT FOR APPROVAL		DRAWN BY RIZ CHECKED BY JKR DATE STARTED 04.02.2013 DATE COMPLETED _____ OPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC						INDEX	PLANT NO.	DRAWING NUMBER	SHEET NO.
REV. NO.	DATE	DESCRIPTION						-	C421	CD-322935	L02	L03	02

	1	2	3	4	5	6	7	8	9	10
A	SR. NO.	GA. REF.	SCH. REF.	D E S C R I P T I O N		SHEET. NO.	QTY.	TYPE	MAKE	ORDERING INFORMATION
	16	U32.101	74AVC1	DUAL COIL RELAY FOR AVC1 DC SUPERVISION		236	3	RXSF1	ABB	RK 271 019-AN
		U32.107	74AVC2	AUX. VOLTAGE :110-125V DC		336				
		U32.301	74AVC3	CONTACTS : 2NO+1NC PER COIL		436				
B	17	U32.307	IC1X	DUAL COIL RELAY FOR CONTACT MULTIPLICATION(13.8KV)		231	5	RXMB1	ABB	1MRK 000 803-AN
		U32.113	IC2X	AUX. VOLTAGE :110-125V DC						
		U32.313	IC3X	CONTACTS : 3NO PER COIL						
		U32.119	BS1X							
		U32.319	BS2X							
C	18	U32.125	Y1/Y2	DUAL COIL RELAY FOR OLTC TAP LOWER & RAISE		235	3	RXMB1	ABB	1MRK 000 804-AN
		U32.325	Y3/Y4	AUX. VOLTAGE :110-125V DC		335				
		U32.131	Y5/Y6	CONTACTS : 2NO+1NC PER COIL		435				
	19	U32.331	K1/K2	DUAL COIL RELAY FOR OLTC TAP LOWER & RAISE		233	3	RXMB1	ABB	1MRK 000 803-AN
		U32.137	K3/K4	AUX. VOLTAGE :110-125V DC		333				
		U32.337	K5/K6	CONTACTS : 3NO PER COIL		433				
D										
	20	U39.5001	Q1	MCB 2 POLE 6A, FOR DC SUPPLY		216	3	S282-K10	ABB	GH S282 0164 R0317
		U39.5002	Q2	WITH 2NC AUXILIARY CONTACT				S2C-H11L		GH S270 1917 R0001
		U39.5003	Q3	Q1 AVC± SUPPLY						
E	21	U39.5004	C01	CONVENIENCE OUTLET 10A, 127V AC		211	1	USM45 &	LEGRAND	74140 & 74180
			C02	CONVENIENCE OUTLET 10A, 220V AC				USMS45		
	22	U39.5005	TJ	TELEPHONE JACK IGANG 4WIRE		211	1	EDF410	EDISON	EDF410
	23		C1,C2	MINIATURE CIRCUIT BREAKER, 2 POLE, 10A FOR		211	1	S202-K10	ABB	2CDS 252 001 R0427
				CONVENIENCE OUTLET WITH AUXILIARY SWITCH, 1NO + 1NC CONTACTS				S2C-H11L		GH 3270 1917 R0001
			C3	THERMOSTAT FOR SPACE HEATER, 5-60°C		211	1	SK 3110	RITTAL	SK 3110
			C7	ON/OFF SWITCH FOR SPACE HEATER		211	1	M2SS1-10B	ABB	1SFA 611 200 R1006
F								MCBH -10		

AS-BUILT BY _____ DATE _____		CONTRACT NO. 11131113/00		JOB ORDER NO. S-13020		LIST OF APPARATUS 132/13.8KV (GT1,GT2,GT3) AVC PANEL S/S 8709 - 132/13.8KV IN AL-KHARJ CITY RIYADH SAUDI ARABIA		الشركة الوطنية لنقل الكهرباء نقل الكهرباء National Grid sa	
02	13 49	FACTORY ASBUILT		DRAWN BY RIZ CHECKED BY JKR				INDEX	PLANT NO.
01	13 25	AS PER SEC COMMENT		DATE STARTED 04.02.2013 DATE COMPLETED _____		-	C421	CD-322935	02
00	13 06	FOR APPROVAL		OPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC					
REV. NO.	DATE	DESCRIPTION							

		1	2	3	4	5	6	7	8	9	10
A		LABEL REF.	LABEL ENGRAVING	MATERIALS	ENGRAVING	LABEL SIZE	LETTER SIZE				
		U08.5001	U08.5001 90-1	TRAFOLITE	BLACK LETTERS ON WHITE BACKGROUND	50X15mm	4mm				
		U11.5001	U11.5001 90-2	TRAFOLITE	BLACK LETTERS ON WHITE BACKGROUND	50X10mm	3mm				
		U14.5001	U14.5001 90-3	TRAFOLITE	BLACK LETTERS ON WHITE BACKGROUND	50X10mm	3mm				
		U24.5001	U24.5001 L01	TRAFOLITE	BLACK LETTERS ON WHITE BACKGROUND	50X15mm	4mm				
		U24.5002	U24.5002 L02	TRAFOLITE	BLACK LETTERS ON WHITE BACKGROUND	50X15mm	4mm				
		U24.5003	U24.5003 L03	TRAFOLITE	BLACK LETTERS ON WHITE BACKGROUND	50X15mm	4mm				
		U24.5004	U24.5004 L04	TRAFOLITE	BLACK LETTERS ON WHITE BACKGROUND	50X15mm	4mm				
		U24.5005	U24.5005 L05	TRAFOLITE	BLACK LETTERS ON WHITE BACKGROUND	50X15mm	4mm				
		U24.5006	U24.5006 L06	TRAFOLITE	BLACK LETTERS ON WHITE BACKGROUND	50X15mm	4mm				
B		U24.5007	U24.5007 P81	TRAFOLITE	BLACK LETTERS ON WHITE BACKGROUND	50X15mm	4mm				
		U24.5008	U24.5008 P82	TRAFOLITE	BLACK LETTERS ON WHITE BACKGROUND	50X15mm	4mm				
		U30.5001	U30.5001 PBES-1	TRAFOLITE	BLACK LETTERS ON WHITE BACKGROUND	50X15mm	4mm				
		U30.5002	U30.5002 L1-1	TRAFOLITE	BLACK LETTERS ON WHITE BACKGROUND	50X15mm	4mm				
		U26.5001	U26.5001 L07	TRAFOLITE	BLACK LETTERS ON WHITE BACKGROUND	50X15mm	4mm				
		U26.5002	U26.5002 L08	TRAFOLITE	BLACK LETTERS ON WHITE BACKGROUND	50X15mm	4mm				
		U26.5003	U26.5003 L09	TRAFOLITE	BLACK LETTERS ON WHITE BACKGROUND	50X15mm	4mm				
		U26.5004	U26.5004 L10	TRAFOLITE	BLACK LETTERS ON WHITE BACKGROUND	50X15mm	4mm				
		U26.5005	U26.5005 L11	TRAFOLITE	BLACK LETTERS ON WHITE BACKGROUND	50X15mm	4mm				
		U26.5006	U26.5006 L12	TRAFOLITE	BLACK LETTERS ON WHITE BACKGROUND	50X15mm	4mm				
C		U26.5007	U26.5007 P83	TRAFOLITE	BLACK LETTERS ON WHITE BACKGROUND	50X15mm	4mm				
		U26.5008	U26.5008 P84	TRAFOLITE	BLACK LETTERS ON WHITE BACKGROUND	50X15mm	4mm				
		U30.5003	U30.5003 PBES-2	TRAFOLITE	BLACK LETTERS ON WHITE BACKGROUND	50X15mm	4mm				
		U30.5004	U30.5004 L1-2	TRAFOLITE	BLACK LETTERS ON WHITE BACKGROUND	50X15mm	4mm				
		U32.125	U32.125 Y1Y2	ALUMINUM PAPER FOIL	BLACK LETTERS	50X10mm	3mm				
		U32.325	U32.325 Y3Y4	ALUMINUM PAPER FOIL	BLACK LETTERS	50X10mm	3mm				
		U32.131	U32.131 Y5Y6	ALUMINUM PAPER FOIL	BLACK LETTERS	50X10mm	3mm				
D		U28.5001	U28.5001 L13	TRAFOLITE	BLACK LETTERS ON WHITE BACKGROUND	50X15mm	4mm				
		U28.5002	U28.5002 L14	TRAFOLITE	BLACK LETTERS ON WHITE BACKGROUND	50X15mm	4mm				
		U28.5003	U28.5003 L15	TRAFOLITE	BLACK LETTERS ON WHITE BACKGROUND	50X15mm	4mm				
		U28.5004	U28.5004 L16	TRAFOLITE	BLACK LETTERS ON WHITE BACKGROUND	50X15mm	4mm				
		U28.5005	U28.5005 L17	TRAFOLITE	BLACK LETTERS ON WHITE BACKGROUND	50X15mm	4mm				
		U28.5006	U28.5006 L18	TRAFOLITE	BLACK LETTERS ON WHITE BACKGROUND	50X15mm	4mm				
		U28.5007	U28.5007 P85	TRAFOLITE	BLACK LETTERS ON WHITE BACKGROUND	50X15mm	4mm				
		U28.5008	U28.5008 P86	TRAFOLITE	BLACK LETTERS ON WHITE BACKGROUND	50X15mm	4mm				
		U30.5005	U30.5005 PBES-3	TRAFOLITE	BLACK LETTERS ON WHITE BACKGROUND	50X15mm	4mm				
		U30.5006	U30.5006 L1-3	TRAFOLITE	BLACK LETTERS ON WHITE BACKGROUND	50X15mm	4mm				
E											
		U17.5001	U20.101 Y5-1	ALUMINUM PAPER FOIL	BLACK LETTERS	50X10mm	3mm				
		U17.5002	U20.107 Y5-2	ALUMINUM PAPER FOIL	BLACK LETTERS	50X10mm	3mm				
		U17.5003	U20.113 Y5-3	ALUMINUM PAPER FOIL	BLACK LETTERS	50X10mm	3mm				
		U17.5004	U20.119 Y5-DV1	ALUMINUM PAPER FOIL	BLACK LETTERS	50X10mm	3mm				
		U17.5005	U20.125 Y5-DV2	ALUMINUM PAPER FOIL	BLACK LETTERS	50X10mm	3mm				
		U17.5006	U20.131 Y5-DV3	ALUMINUM PAPER FOIL	BLACK LETTERS	50X10mm	3mm				
F		U32.101	U32.101 74 AVC1	ALUMINUM PAPER FOIL	BLACK LETTERS	50X10mm	3mm				
		U32.107	U32.107 74 AVC2	ALUMINUM PAPER FOIL	BLACK LETTERS	50X10mm	3mm				
		U32.301	U32.301 74 AVC3	ALUMINUM PAPER FOIL	BLACK LETTERS	50X10mm	3mm				
		U32.307	U32.307 IC1X	ALUMINUM PAPER FOIL	BLACK LETTERS	50X10mm	3mm				
		U32.113	U32.113 IC2X	ALUMINUM PAPER FOIL	BLACK LETTERS	50X10mm	3mm				
		U32.313	U32.313 IC3X	ALUMINUM PAPER FOIL	BLACK LETTERS	50X10mm	3mm				
		U32.119	U32.119 BS1X	ALUMINUM PAPER FOIL	BLACK LETTERS	50X10mm	3mm				
		U32.319	U32.319 BS2X	ALUMINUM PAPER FOIL	BLACK LETTERS	50X10mm	3mm				

AS-BUILT BY _____ DATE _____		CONTRACT NO. 1113113/00		JOB ORDER NO. S-13020	
02	13 49	FACTORY ASBUILT		DRAWN BY RIZ CHECKED BY JKR	
01	13 25	AS PER SEC COMMENT		DATE STARTED 04.02.2013 DATE COMPLETED _____	
00	13 06	FOR APPROVAL		OPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC	
REV. NO.	DATE	DESCRIPTION			

LIST OF APPARATUS				نقل الكهرباء الشركة الوطنية لنقل الكهرباء National Grid sa	
132/13.8KV (GT1,GT2,GT3) AVC PANEL					
S/S 8709 - 132/13.8KV IN AL-KHARJ CITY					
RIYADH				SAUDI ARABIA	
INDEX	PLANT NO.	DRAWING NUMBER	SHEET NO.	REV. NO.	
-	C421	CD-322935	L05	L06	02

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LABEL REF.	LABEL ENGRAVING	MATERIALS	ENGRAVING	LABEL SIZE	LETTER SIZE
U39.5001	U39.5001 01	TRAFOLITE	BLACK LETTERS ON WHITE BACKGROUND	50X15mm	4mm
U39.5002	U39.5002 02	TRAFOLITE	BLACK LETTERS ON WHITE BACKGROUND	50X10mm	3mm
U39.5003	U39.5003 03	TRAFOLITE	BLACK LETTERS ON WHITE BACKGROUND	50X10mm	3mm
U39.5004	U39.5004 C01,C02	TRAFOLITE	BLACK LETTERS ON WHITE BACKGROUND	50X15mm	4mm
U39.5005	U39.5005 J	TRAFOLITE	BLACK LETTERS ON WHITE BACKGROUND	50X15mm	4mm
U32.331	U32.331 K1/K2	ALUMINUM PAPER FOIL	BLACK LETTERS	50X10mm	3mm
U32.137	U32.137 K3/K4	ALUMINUM PAPER FOIL	BLACK LETTERS	50X10mm	3mm
U32.337	U32.337 K5/K6	ALUMINUM PAPER FOIL	BLACK LETTERS	50X10mm	3mm

AS-BUILT BY _____ DATE _____		CONTRACT NO. 11131113/00	JOB ORDER NO. S-13020	LIST OF APPARATUS		نقل الكهرباء الشركة الوطنية لنقل الكهرباء National Grid sa	
02	13 49	FACTORY ASBUILT		DRAWN BY RIZ CHECKED BY JKR		132/13.8KV (GT1,GT2,GT3) AVC PANEL	
01	13 25	AS PER SEC COMMENT		DATE STARTED 04.02.2013 DATE COMPLETED _____		S/S 8709 - 132/13.8KV IN AL-KHARJ CITY	
00	13 06	FOR APPROVAL		OPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC		RIYADH SAUDI ARABIA	
REV. NO.	DATE	DESCRIPTION		INDEX	PLANT NO.	DRAWING NUMBER	SHEET NO. SHT CONT.
				-	C421	CD-322935	L06 L07 02

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LABEL REF.	LABEL ENGRAVING	MATERIALS	ENGRAVING	LABEL SIZE	LETTER SIZE
C1	C1 127V AC SUPPLY MCB	TRAFOLITE	BLACK LETTERS ON WHITE BACKGROUND	50X15mm	4mm
C2	C2 220V AC SUPPLY MCB	TRAFOLITE	BLACK LETTERS ON WHITE BACKGROUND	50X15mm	4mm
C3	C3 THERMOSTAT	TRAFOLITE	BLACK LETTERS ON WHITE BACKGROUND	50X15mm	4mm
C7	C7 ON/OFF SWITCH	TRAFOLITE	BLACK LETTERS ON WHITE BACKGROUND	50X15mm	4mm
DS	DS DOOR SWITCH	TRAFOLITE	BLACK LETTERS ON WHITE BACKGROUND	50X15mm	4mm
IL	IL ILLUMINATION LAMP	TRAFOLITE	BLACK LETTERS ON WHITE BACKGROUND	50X15mm	4mm
SH	SH SPACE HEATER	TRAFOLITE	BLACK LETTERS ON WHITE BACKGROUND	50X15mm	4mm

AS-BUILT BY _____ DATE _____		CONTRACT NO. 11131113/00	JOB ORDER NO. S-13020	LIST OF APPARATUS		نقل الكهرباء الشركة الوطنية لنقل الكهرباء National Grid sa	
02	13 49	FACTORY ASBUILT		DRAWN BY RIZ CHECKED BY JKR		132/13.8KV (GT1,GT2,GT3) AVC PANEL	
01	13 25	AS PER SEC COMMENT		DATE STARTED 04.02.2013 DATE COMPLETED _____		S/S 8709 - 132/13.8KV IN AL-KHARJ CITY	
00	13 06	FOR APPROVAL		OPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC		RIYADH SAUDI ARABIA	
REV. NO.	DATE	DESCRIPTION		INDEX	PLANT NO.	DRAWING NUMBER	SHEET NO. SHT CONT.
				-	C421	CD-322935	L07 --- 02

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POWER SYSTEMS NETWORK MANAGEMENT
PROTECTION AND SUBSTATION AUTOMATION SYSTEMS
WBS NO: S-13020

ABB AUTOMATION COMPANY LTD.
414, AL-KHARJ ROAD
SECOND INDUSTRIAL CITY
RIYADH-11383 K.S.A

CONTRACTOR : ABB Contracting Company
CLIENT : National Gridsa
PROJECT : CONSTRUCTION OF NEW 132/13.8kV SS 8709 IN AL-KHARJ CITY
SUBSTATION : S/S 8709
CONTRACT NO. : 11131113/00
TITLE : SCHEMATIC DRAWING +AVC

AS-BUILT BY _____ DATE _____		CONTRACT NO. 11131113/00	JOB ORDER NO. S-13020	COVER SHEET		الشركة الوطنية لنقل الكهرباء		نقل الكهرباء	
02	13 49	FACTORY ASBUILT	DRAWN BY RIZ	CHECKED BY JKR	132/13.8KV (GT1,GT2,GT3) AVC PANEL	National Grid sa			
01	13 25	AS PER SEC COMMENT	DATE STARTED 04.02.2013		S/S 8709 - 132/13.8KV IN AL-KHARJ CITY		INDEX	PLANT NO.	DRAWING NUMBER
00	13 06	FOR APPROVAL	DATE COMPLETED _____		RIYADH SAUDI ARABIA		-	C421	CD-322936
REV. NO.	DATE	DESCRIPTION	OPRG. DEPT. CTPD	ENG. DEPT. AUT-PSAC			SHEET NO.	REV. NO.	
							SHT	CONT.	
							001	002	02

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CONTENTS	ABB SHT.NO.	REV.00	REV.01	REV.02
COVER SHEET	001	X	X	X
CONTENTS SHEET	002	X	X	X
GRAPHICAL SYMBOLS FOR DIAGRAMS	011	X	X	X
GRAPHICAL SYMBOLS FOR DIAGRAMS	012	X	X	X
COMMON LEGEND	013	X	X	X
FERRULE AND WIRING DETAILS	014	X	X	X
DRAWING REFERENCES	015	X	X	X
AC SUPPLY FOR ILLUMINATION & POWER SOCKET	211	X	X	X
CUB. LIGHTING, HEATER & SOCKET ALARM CKT.	212	X	X	X
DC SUPPLY DISTRIBUTION	216	X	X	X
CT & VT CIRCUITS 90 RELAY FOR GT1,GT2,GT3	221,222,223	X	X	X
BINARY INPUTS-GT1,GT2,GT3	231,331,431	X	X	X
BINARY INPUTS-GT1,GT2,GT3	233,333,433	X	X	X
TAP CHANGER RAISE/LOWER CIRCUITS	235,335,435	X	X	X
INDICATION CIRCUITS	236,336,436	X	X	X
TAP CHANGER RAISE/LOWER CIRCUITS	237,337,437	X	X	X
STN-COMMN ALARM CIRCUITS	293,393,493	X	X	X
BLOCK REFERENCE	498-502	X	X	X
TERMINAL BLOCK ALLOCATION	503-504	X	X	X

AS-BUILT BY _____ DATE _____		CONTRACT NO. 11131113/00		JOB ORDER NO. S-13020		CONTENTS SHEET		نقل الكهرباء الشركة الوطنية لنقل الكهرباء National Grid sa	
02	13 49	FACTORY ASBUILT		DRAWN BY RIZ CHECKED BY JKR		132/13.8KV (GT1,GT2,GT3) AVC PANEL			
01	13 25	AS PER SEC COMMENT		DATE STARTED 04.02.2013 DATE COMPLETED _____		S/S 8709 - 132/13.8KV IN AL-KHARJ CITY			
00	13 06	FOR APPROVAL		OPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC		RIYADH		SAUDI ARABIA	
REV. NO.	DATE	DESCRIPTION				INDEX	PLANT NO.	DRAWING NUMBER	SHEET NO.
						-	C421	CD-322936	002 011 02

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SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	FRAME CONNECTION		MAIN CONTACT OF A CIRCUIT BREAKER		RELAY WITH TWO MAKE CONTACTS, ONE OF THEM DELAYED WHEN OPERATING
	EARTH CONNECTION		PASSING MAKE CONTACT CLOSING MOMENTARILY DURING OPERATION AND RELEASE		RELAY WITH TWO ACTUATORS AND A TWO STABLE POSITIONS
	RESISTOR		BREAK CONTACT DELAYED WHEN OPERATING		SIGNALLING LAMP
	VARIABLE RESISTOR		MAKE CONTACT DELAYED WHEN RELEASING		MECHANICAL INDICATOR WITH AUTOMATIC RESET
	RESISTOR WITH PRESET ADJUSTMENT		TWO MECHANICAL LINKS CROSSING WITHOUT CONNECTION		MECHANICAL INDICATOR WITH NON-AUTOMATIC RESET
	CAPACITOR		JUNCTION OF MECHANICAL LINKS		ELECTRICALLY CONTROLLED MECHANICAL INDICATOR WITH AUTOMATIC RESET
	SEMICONDUCTOR DIODE USED AS A CAPACITIVE DEVICE		AUTOMATIC RESET		ELECTRICALLY CONTROLLED MECHANICAL INDICATOR WITH NON-AUTOMATIC RESET
	OPEN CONTACT, MAKE CONTACT		NON-AUTOMATIC RESET		RELAY WITH MAKE CONTACT
	CLOSED CONTACT, BREAK CONTACT		SWITCHING DEVICE WITH MANUAL OPERATION AND WITH AUTOMATIC RESET		RELAY WITH CHANGE-OVER CONTACT
	CHANGE-OVER CONTACT, BREAK BEFORE MAKE		SWITCHING DEVICE WITH MANUAL OPERATION AND WITH NON-AUTOMATIC RESET		ELECTRO-MECHANICAL POSITION INDICATOR WITH ONE DE-ENERGIZED AND ONE OPERATED POSITION
	MAKE CONTACT WHICH IS EARLY WHEN OPERATING AND LATE WHEN RELEASING		CHANGE-OVER SWITCHING DEVICE WITH MANUAL CONTROL AUTOMATIC RESET FROM POSITION 1-2 TO THE NEUTRAL POSITION		ELECTRO-MECHANICAL POSITION INDICATOR WITH ONE DE-ENERGIZED AND TWO OPERATED POSITION
	BREAK CONTACT WHICH IS LATE WHEN OPERATING AND EARLY WHEN RELEASING		RELAY WITH MAKE CONTACT		BELL, BUZZER
	SWITCHING DEVICE WITH MANUAL CONTROL		RELAY WITH MAKE CONTACT, DELAYED WHEN OPERATING		SIREN , HORN
	MAKE CONTACT DELAYED WHEN OPERATING		RELAY WITH MAKE CONTACT, DELAYED WHEN RELEASING		
	BREAK CONTACT DELAYED WHEN RELEASING		RELAY WITH MAKE CONTACT, DELAYED WHEN OPERATING AND RELEASING		
	MAKE CONTACT DELAYED WHEN OPERATING AND RELEASING				
	MAIN CONTACT OF A SWITCH DISCONNECTOR				
	MAIN CONTACT OF A DISCONNECTOR				

AS-BUILT BY _____ DATE _____		CONTRACT NO. 11131113/00		JOB ORDER NO. S-13020		GRAPHICAL SYMBOLS FOR DIAGRAMS		الشركة الوطنية لنقل الكهرباء		نقل الكهرباء	
02 13 49		FACTORY ASBUILT		DRAWN BY RIZ CHECKED BY JKR		132/13.8KV (GT1,GT2,GT3) AVC PANEL		National Grid sa			
01 13 25		AS PER SEC COMMENT		DATE STARTED 04.02.2013 DATE COMPLETED _____		S/S 8709 - 132/13.8KV IN AL-KHARJ CITY		INDEX		PLANT NO.	
00 13 06		FOR APPROVAL		OPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC		RIYADH SAUDI ARABIA		DRAWING NUMBER		SHEET NO.	
REV. NO.		DATE		DESCRIPTION				- C421		CD-322936	
										REV. NO.	
										011 012 02	

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<table><tr><td colspan="2">AS-BUILT BY _____ DATE _____</td><td colspan="2">CONTRACT NO. 11131113/00</td><td colspan="2">JOB ORDER NO. S-13020</td><td colspan="2">GRAPHICAL SYMBOLS FOR DIAGRAMS 132/13.8KV (GT1,GT2,GT3) AVC PANEL</td><td colspan="2">الشركة الوطنية لنقل الكهرباء National Grid sa</td></tr><tr><td>02</td><td>13 49</td><td colspan="2">FACTORY ASBUILT</td><td colspan="2">DRAWN BY RIZ CHECKED BY JKR</td><td colspan="2">S/S 8709 - 132/13.8KV IN AL-KHARJ CITY</td><td>INDEX</td><td>PLANT NO.</td></tr><tr><td>01</td><td>13 25</td><td colspan="2">AS PER SEC COMMENT</td><td colspan="2">DATE STARTED 04.02.2013 DATE COMPLETED _____</td><td colspan="2">RIYADH SAUDI ARABIA</td><td>-</td><td>C421</td></tr><tr><td>00</td><td>13 06</td><td colspan="2">FOR APPROVAL</td><td colspan="2">OPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC</td><td colspan="2"></td><td></td><td>CD-322936</td></tr><tr><td>REV. NO.</td><td>DATE</td><td colspan="2">DESCRIPTION</td><td colspan="2"></td><td colspan="2"></td><td></td><td></td></tr></table>										AS-BUILT BY _____ DATE _____		CONTRACT NO. 11131113/00		JOB ORDER NO. S-13020		GRAPHICAL SYMBOLS FOR DIAGRAMS 132/13.8KV (GT1,GT2,GT3) AVC PANEL		الشركة الوطنية لنقل الكهرباء National Grid sa		02	13 49	FACTORY ASBUILT		DRAWN BY RIZ CHECKED BY JKR		S/S 8709 - 132/13.8KV IN AL-KHARJ CITY		INDEX	PLANT NO.	01	13 25	AS PER SEC COMMENT		DATE STARTED 04.02.2013 DATE COMPLETED _____		RIYADH SAUDI ARABIA		-	C421	00	13 06	FOR APPROVAL		OPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC					CD-322936	REV. NO.	DATE	DESCRIPTION																																																											
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LEGENDS

±R1	DC SUPPLY - MAIN PROTECTION
±R2	DC SUPPLY - SECONDARY PROTECTION
±R3	DC SUPPLY - BACK UP PROTECTION
±IT	DC SUPPLY - INTER TRIP
FL	DC SUPPLY - FLASHING CIRCUIT
BB RS±	DC SUPPLY - BUS BAR - PROTECTION RESET
BB CBF±/CBF±	DC SUPPLY - CBF PROTECTION
R	RESET BUS - ALARM SYSTEM
CR	CONTROL ROOM
ECC	ENERGY CONTROL CENTRE
LOCAL	THE LOCATION OF CONTROLLED DEVICE
REMOTE	ANY OTHER LOCATION NOT LOCAL
ON	CB NORMALLY OPEN AUXILIARY CONTACT
OFF	CB NORMALLY CLOSED AUXILIARY CONTACT
A	COMMON
T	TEST POSITION
S	SERVICE POSITION
CS	CLOSE IN SERVICE POSITION
CT	CLOSE IN TEST POSITION
LS	LOCAL SERVICE
LT	LOCAL TEST
LC	LOCAL CLOSE
LO	LOCAL OPEN
RO	REMOTE OPEN

NOTES

LABELS

WHITE LABEL WITH BLACK LETTERING WILL BE PROVIDED FOR ALL MOUNTED APPARATUS EQUIPMENT IDENTIFICATION AND FUNCTION REFERENCE LABEL WILL BE PROVIDED FOR FRONT MOUNTED EQUIPMENTS OF THE PANEL AND EQUIPMENT IDENTIFICATION LABEL WILL BE PROVIDED FOR INTERNALLY MOUNTED EQUIPMENTS

WIRING

PVC INSULATED 600V GRADE
2.5 SQ.mm. YELLOW COLOURED FOR CT CIRCUITS
2.5 SQ.mm. RE COLOURED FOR VT CIRCUITS
1.5 SQ.mm. GREY COLOURED FOR DC SUPPLY, SCADA AND CONTROL CIRCUITS
2.5 SQ.mm. BLACK COLOURED FOR AVC AND AC CIRCUITS
2.5 SQ.mm. YELLOW/GREEN COLOURED FOR EARTHING CONNECTIONS
FOLLOWING MARKERS SHALL BE PROVIDED ON FOLLOWING WIRES:
+ SIGN FOR DC + WIRE
- SIGN FOR DC - WIRE

LUGS

A. CT CIRCUITS- RING TYPE
B. OTHER CIRCUITS - SPADE TYPE

FERULLING

YELLOW TUBE 3.2 mm FOR 1.5SQ mm WIRES AND 4.2 FOR 2.5 SQ mm WIRES
(AS PER 31 - TMSS-1, RE.0)

AS-BUILT BY _____ DATE _____		CONTRACT NO. 11131113/00	JOB ORDER NO. S-13020	COMMON LEGEND		نقل الكهرباء الشركة الوطنية لنقل الكهرباء National Grid SA	
02	13 49	FACTORY ASBUILT	DRAWN BY RIZ	CHECKED BY JKR	132/13.8KV (GT1,GT2,GT3) AVC PANEL		
01	13 25	AS PER SEC COMMENT	DATE STARTED 04.02.2013 DATE COMPLETED _____		S/S 8709 - 132/13.8KV IN AL-KHARJ CITY		
00	13 06	FOR APPROVAL	PRG. DEPT. CTPD ENG. DEPT. AUT-PSAC		RIYADH SAUDI ARABIA		
REV. NO.	DATE	DESCRIPTION			INDEX	PLANT NO.	DRAWING NUMBER
					-	C421	CD-322936
							SHEET NO. SHT CONT.
							SHEET NO. 013 014
							REV. NO. 02

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FOR 132kV RELAY & CONTROL, PROT.N. PANELS

AS PER IEC-391 FIG 14a (W/O SUPPLEMENTARY/IDENTIFICATION MARK)

NOTE:1 ADDITIONAL MARKING AS APPLICABLE

NOTE:2 FERRULE NUMBERING WILL BE BLACK LETTERS ON YELLOW TUBE
3.2 mm for 1.5 sq mm wires and
4.2 mm for 2.5 sq mm wires
(As per 31-TWSS-1, REV 0)

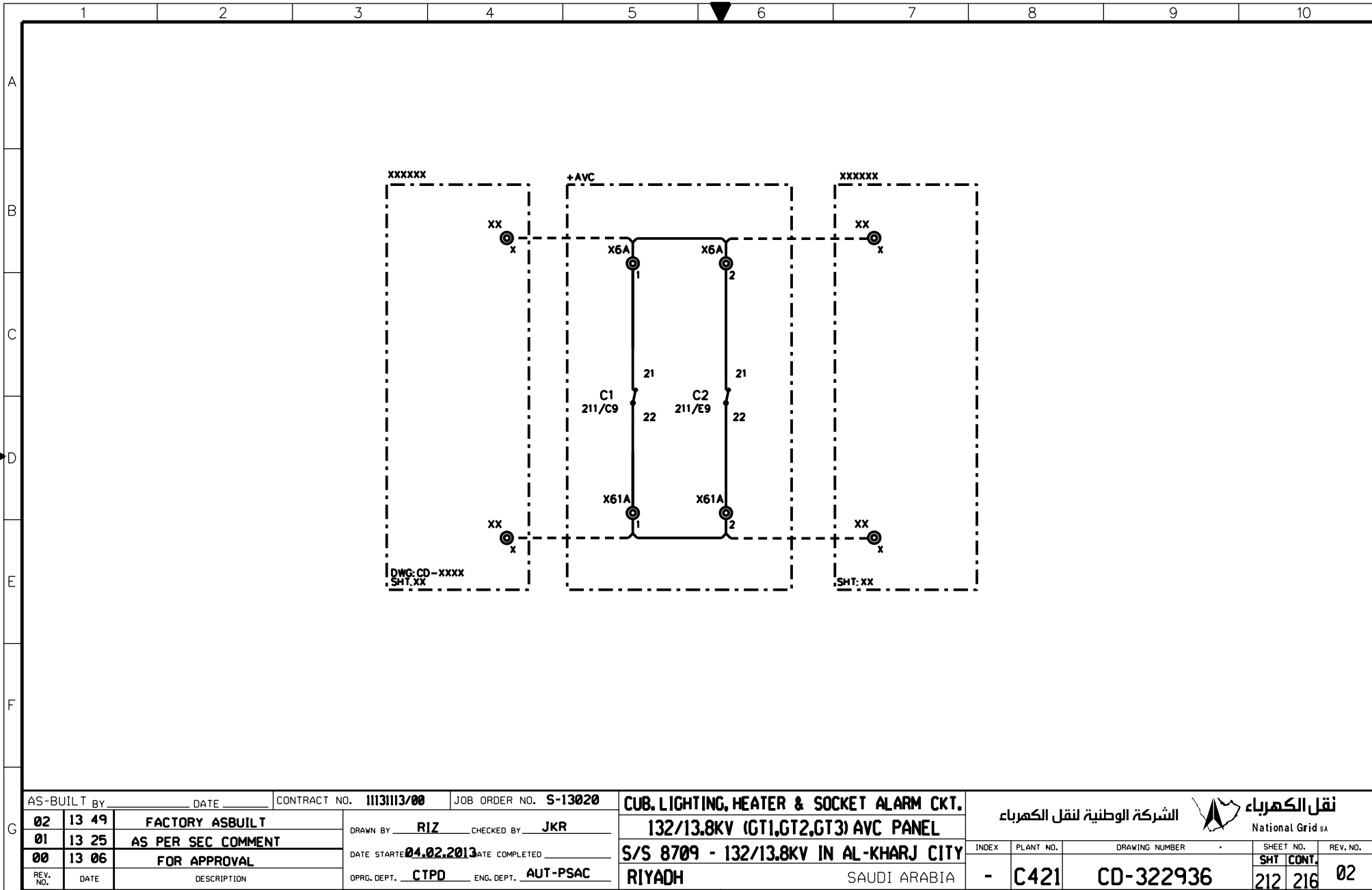
NOTE:3 STARTING POINT OF THE FERRULE LEFT TO RIGHT

FOR 132kV PANELS INTERPANEL WIRING

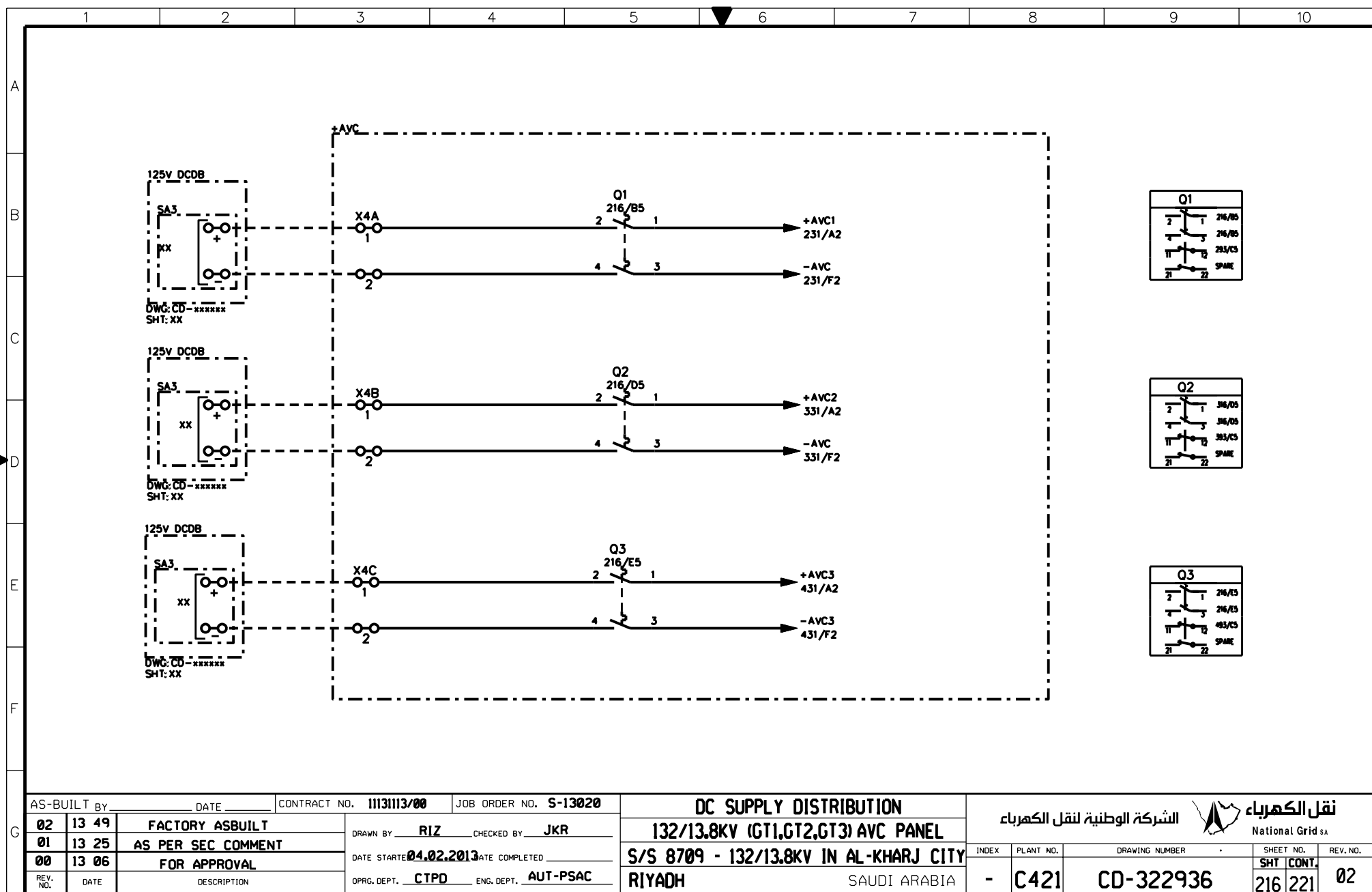
AS PER IEC-391 FIG 14d (W/O SUPPLEMENTARY/IDENTIFICATION MARK)


<p>WIRES - PVC insulated, stranded, coiled annealed copper conductor graded for 1000V</p>	a. CT Circuits - 2.5 Sqmm PVC Yellow colour
	b. VT Circuits - 1.5 Sqmm PVC Red colour
	c. DC, & CONTROL Circuits - 1.5 Sqmm PVC Grey colour
	d. Alarm Circuits - 1.0 Sqmm PVC Blue colour
	e. AVC & AC Circuits - 2.5 Sqmm PVC Black colour
	f. Earth Circuits - 2.5 Sqmm PVC Yellow/Green colour
<p>LUGS - Pre-insulated</p>	a) CT Circuits - Ring type
	b) Other Circuits - Spode type

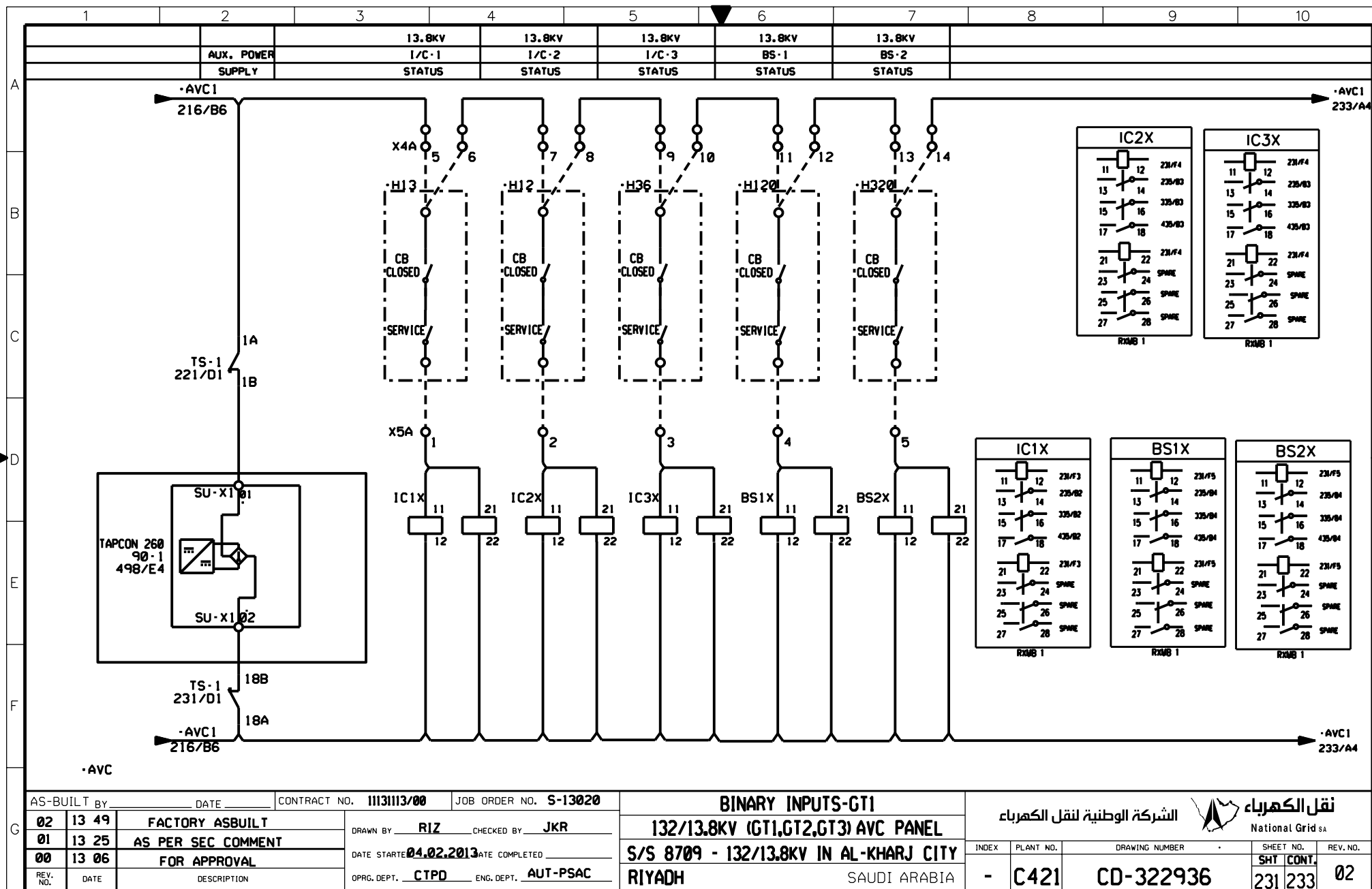
AS-BUILT BY _____ DATE _____		CONTRACT NO. 11131113/00	JOB ORDER NO. S-13020	FERRULE AND WIRING DETAILS		نقل الكهرباء الشركة الوطنية لنقل الكهرباء National Grid sa			
02 13 49 01 13 25 00 13 06		DRAWN BY RIZ CHECKED BY JKR DATE STARTED 04.02.2013 DATE COMPLETED _____ OPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC		132/13.8KV (GT1,GT2,GT3) AVC PANEL S/S 8709 - 132/13.8KV IN AL-KHARJ CITY RIYADH SAUDI ARABIA					
REV. NO.	DATE	DESCRIPTION			INDEX	PLANT NO.	DRAWING NUMBER	SHEET NO.	REV. NO.
					-	C421	CD-322936	SHT 014 CONT. 211	02



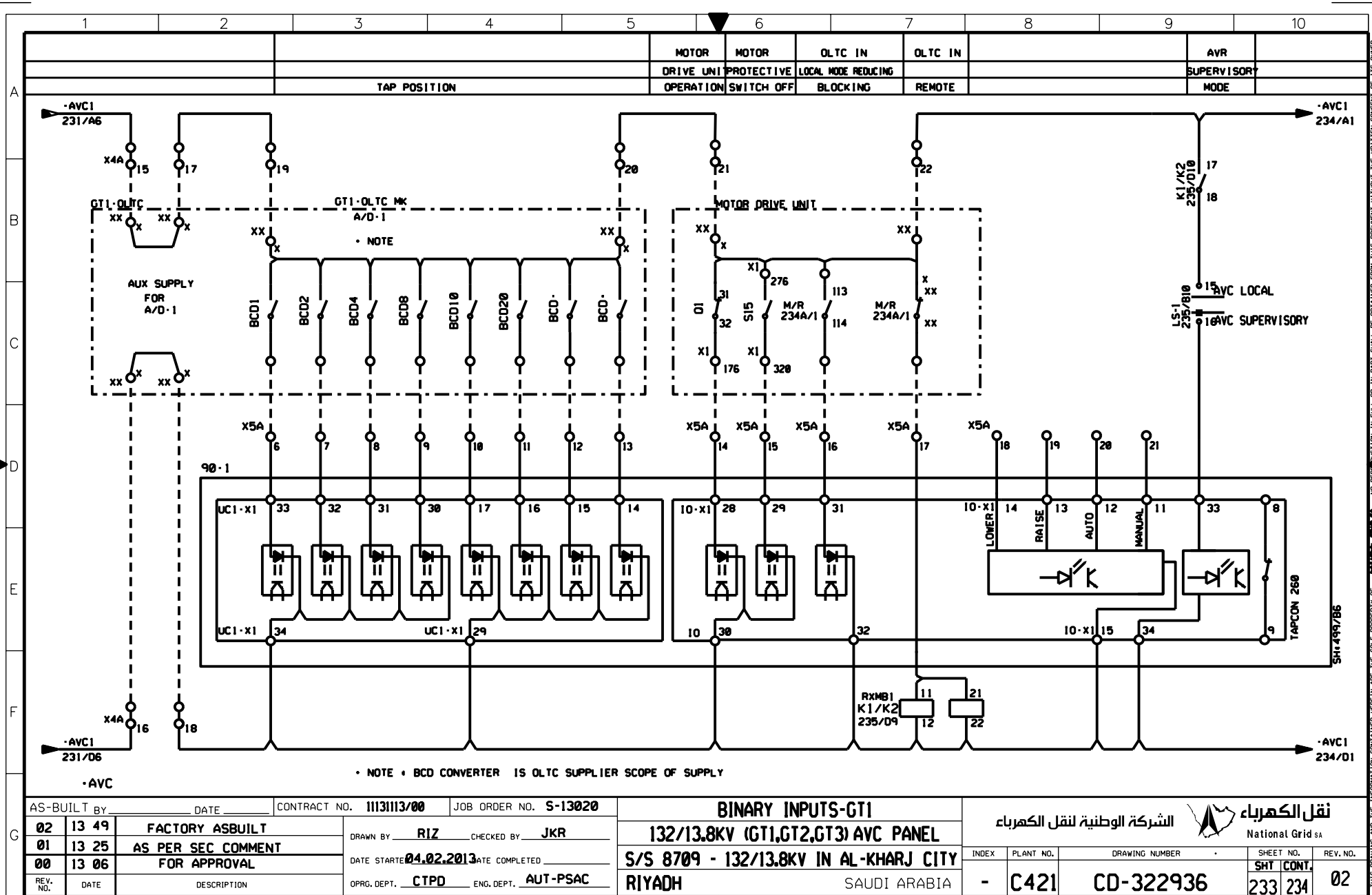
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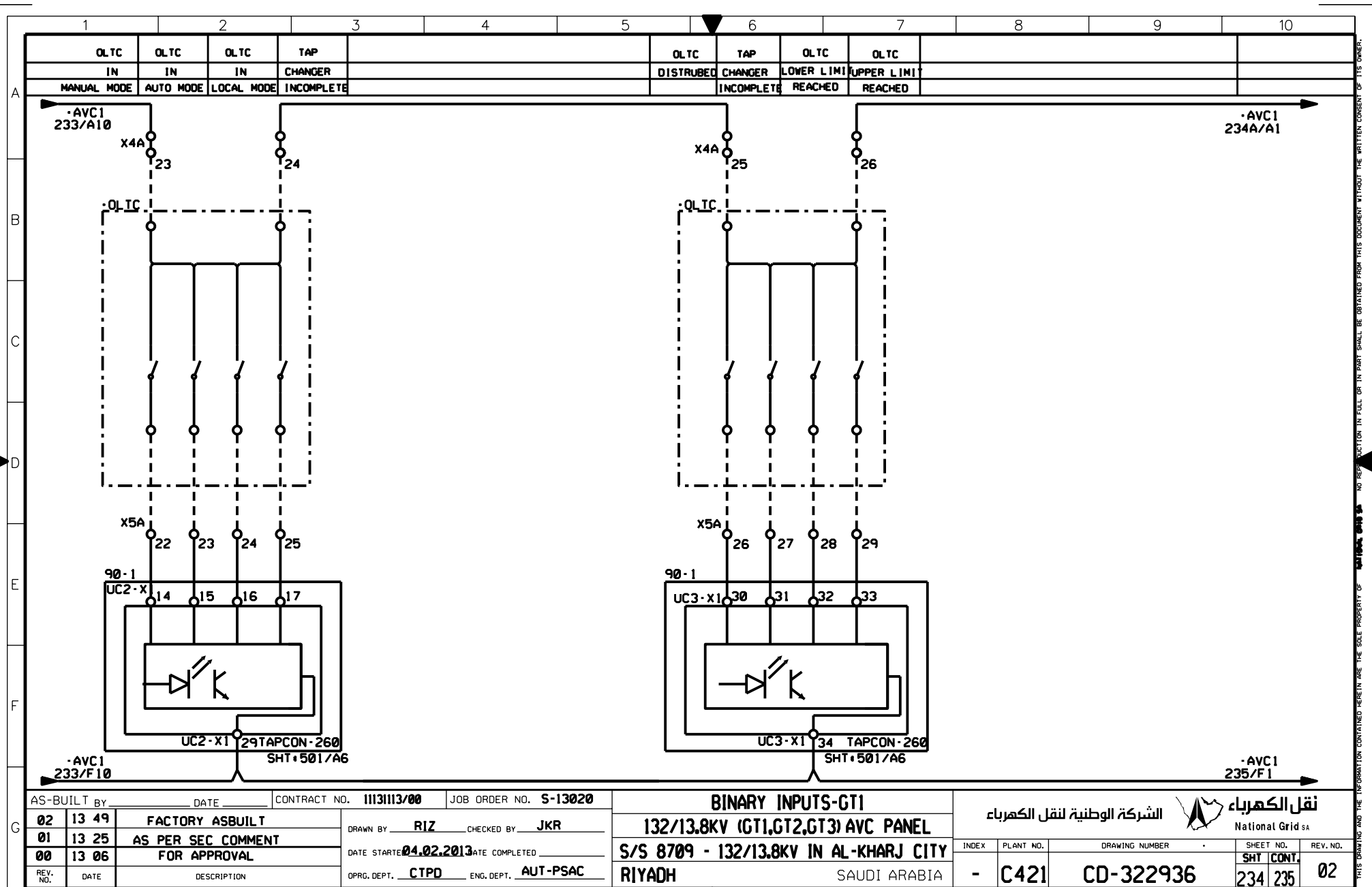


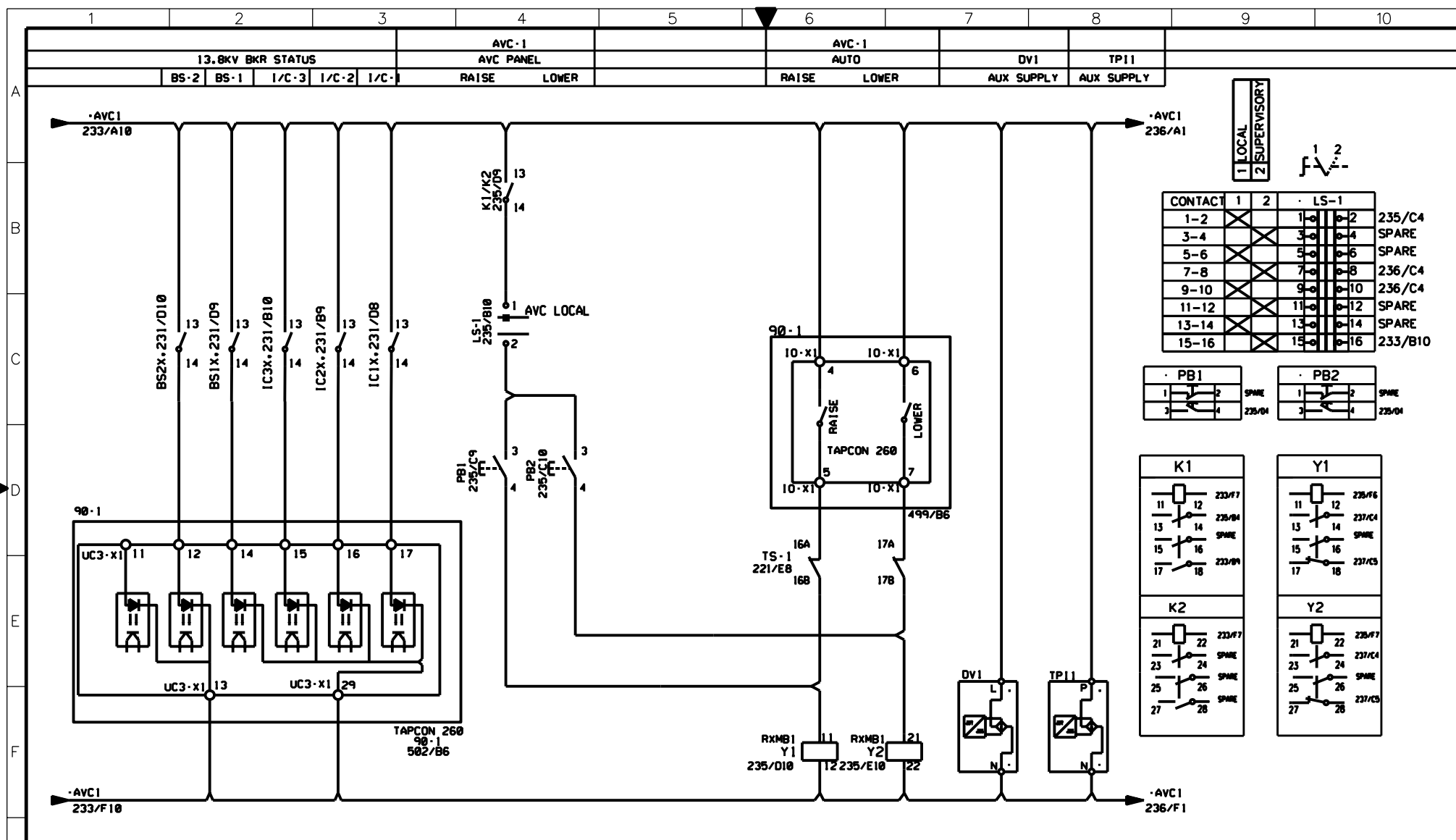
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							132/13.8KV (GT1,GT2,GT3) AVC PANEL								National Grid sa			
FACTORY ASBUILT			DRAWN BY RIZ		CHECKED BY JKR		S/S 8709 - 132/13.8KV IN AL-KHARJ CITY				INDEX		PLANT NO.		DRAWING NUMBER		SHEET NO.	
AS PER SEC COMMENT			DATE STARTED 04.02.2013		DATE COMPLETED		RIYADH				-		C421		CD-322936		216	
FOR APPROVAL			OPRG. DEPT. CTPD		ENG. DEPT. AUT-PSAC		SAUDI ARABIA										221	
REV. NO.			DATE		DESCRIPTION												02	



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AS-BUILT BY _____ DATE _____ CONTRACT NO. **1113113/00** JOB ORDER NO. **S-13020**

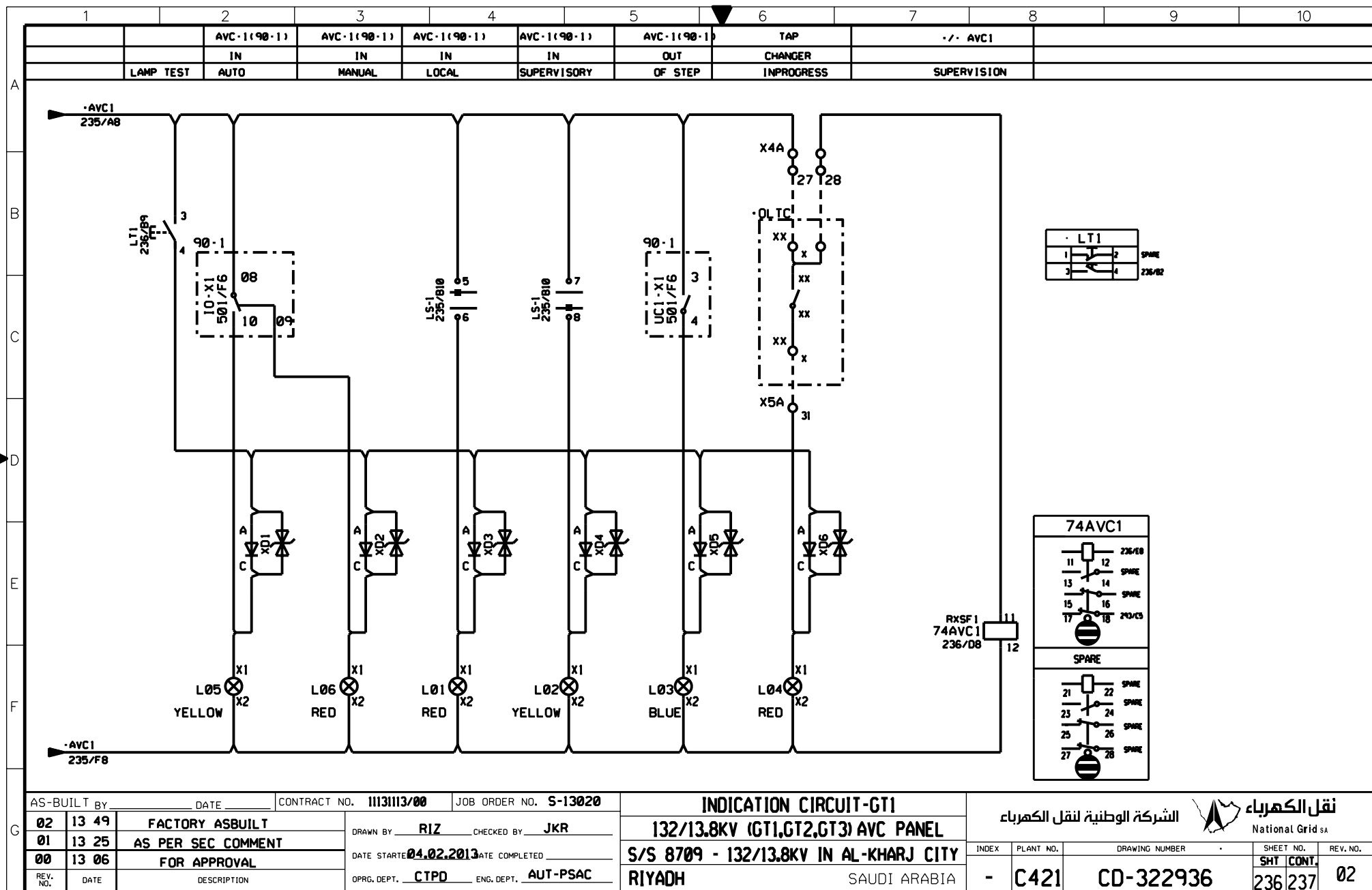
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01 13 25 **AS PER SEC COMMENT**
00 13 06 **FOR APPROVAL**

DRAWN BY **RIZ** CHECKED BY **JKR**
 DATE STARTED **04.02.2013** DATE COMPLETED _____
 OPRG. DEPT. **CTPD** ENG. DEPT. **AUT-PSAC**

TAP CHANGER RAISE/LOWER CIRCUITS
132/13.8KV (GT1,GT2,GT3) AVC PANEL
S/S 8709 - 132/13.8KV IN AL-KHARJ CITY
RIYADH SAUDI ARABIA

الشركة الوطنية لنقل الكهرباء
 National Grid SA

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AS-BUILT BY _____ DATE _____ CONTRACT NO. **11131113/00** JOB ORDER NO. **S-13020**

02	13 49	FACTORY ASBUILT
01	13 25	AS PER SEC COMMENT
00	13 06	FOR APPROVAL
REV. NO.	DATE	DESCRIPTION

DRAWN BY **RIZ** CHECKED BY **JKR**

DATE STARTED **04.02.2013** DATE COMPLETED _____

OPRG. DEPT. **CTPD** ENG. DEPT. **AUT-PSAC**

INDICATION CIRCUIT-GT1

132/13.8KV (GT1,GT2,GT3) AVC PANEL

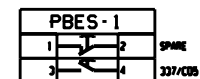
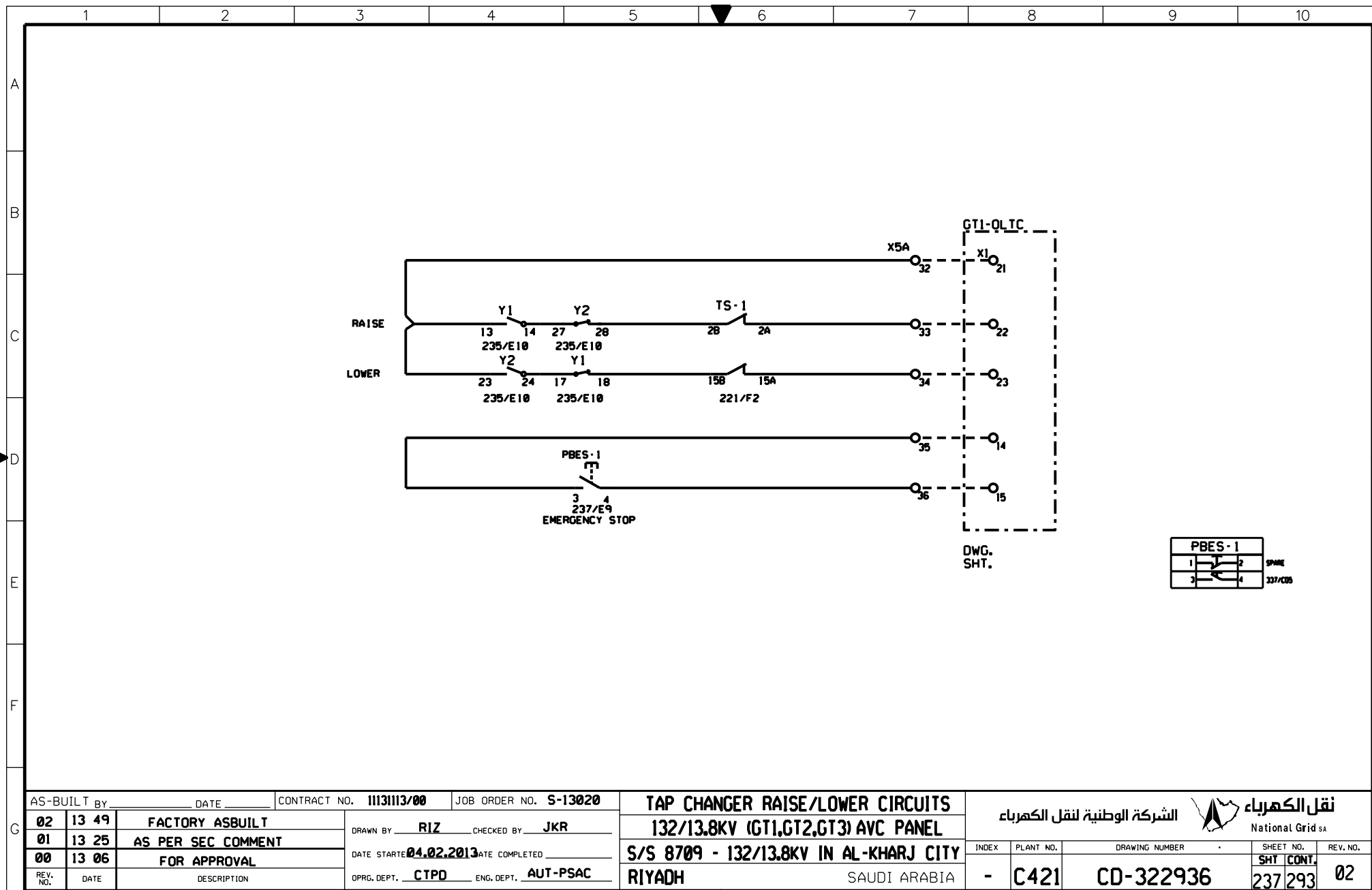
S/S 8709 - 132/13.8KV IN AL-KHARJ CITY

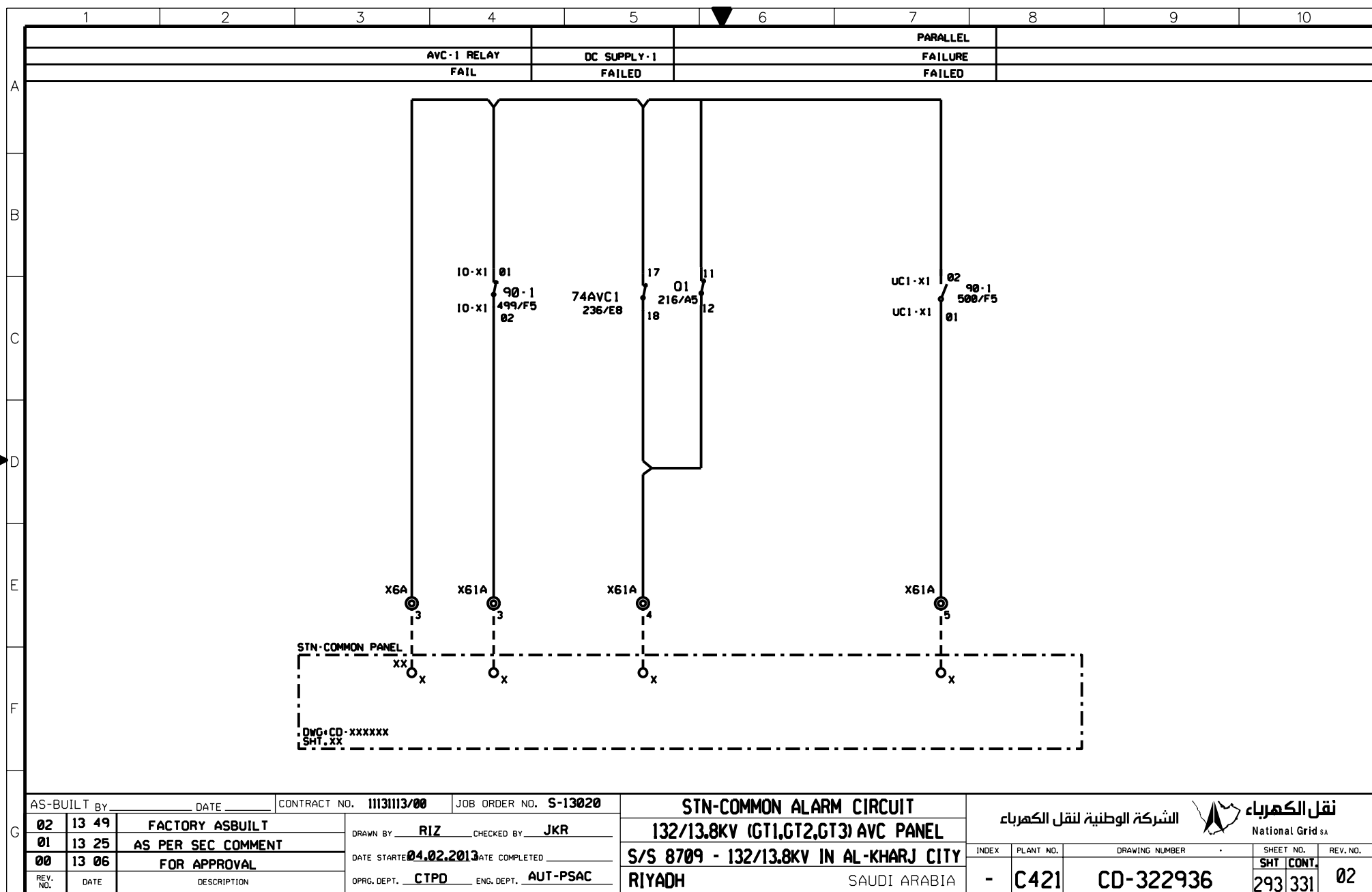
RIYADH SAUDI ARABIA

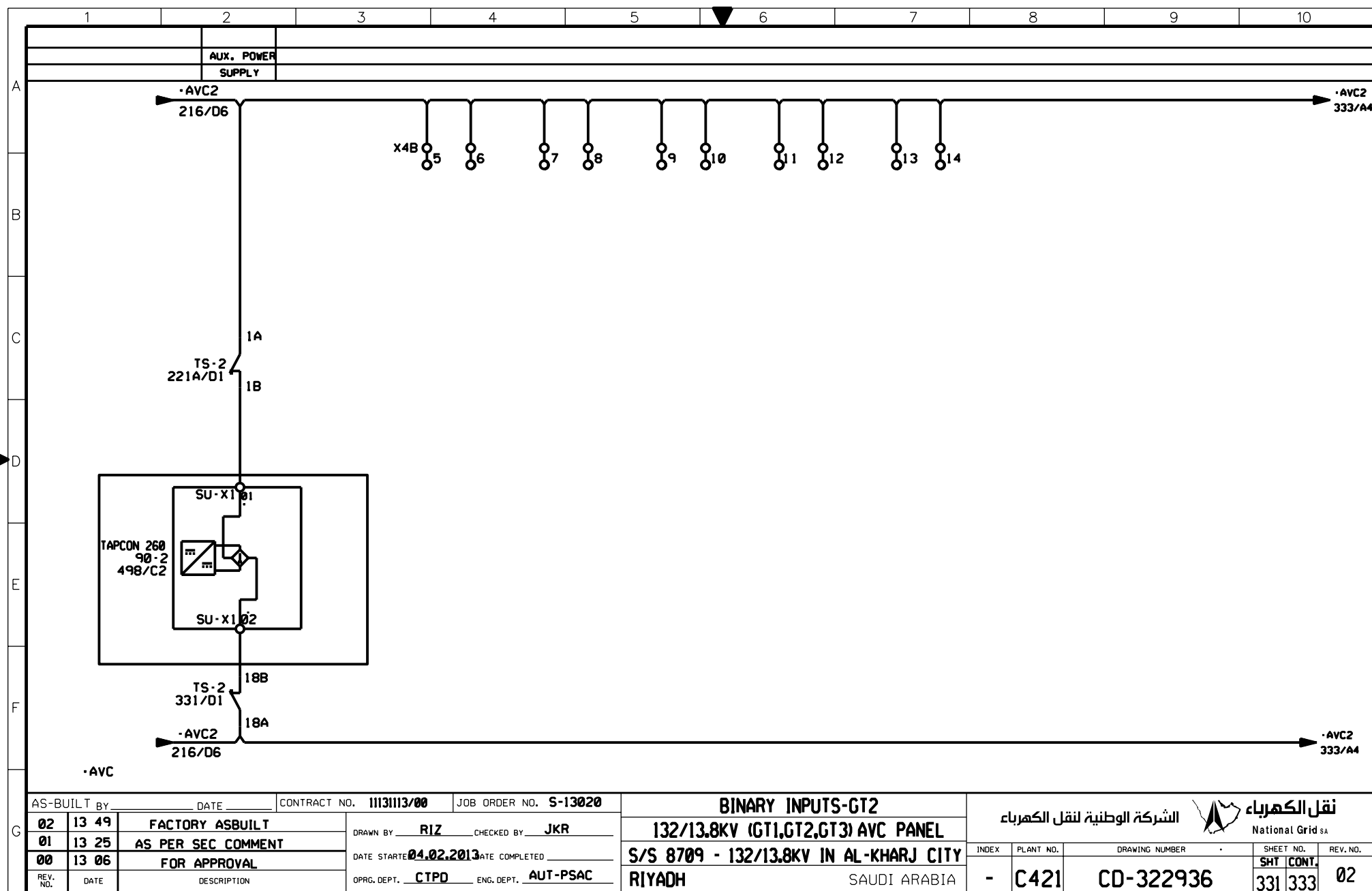
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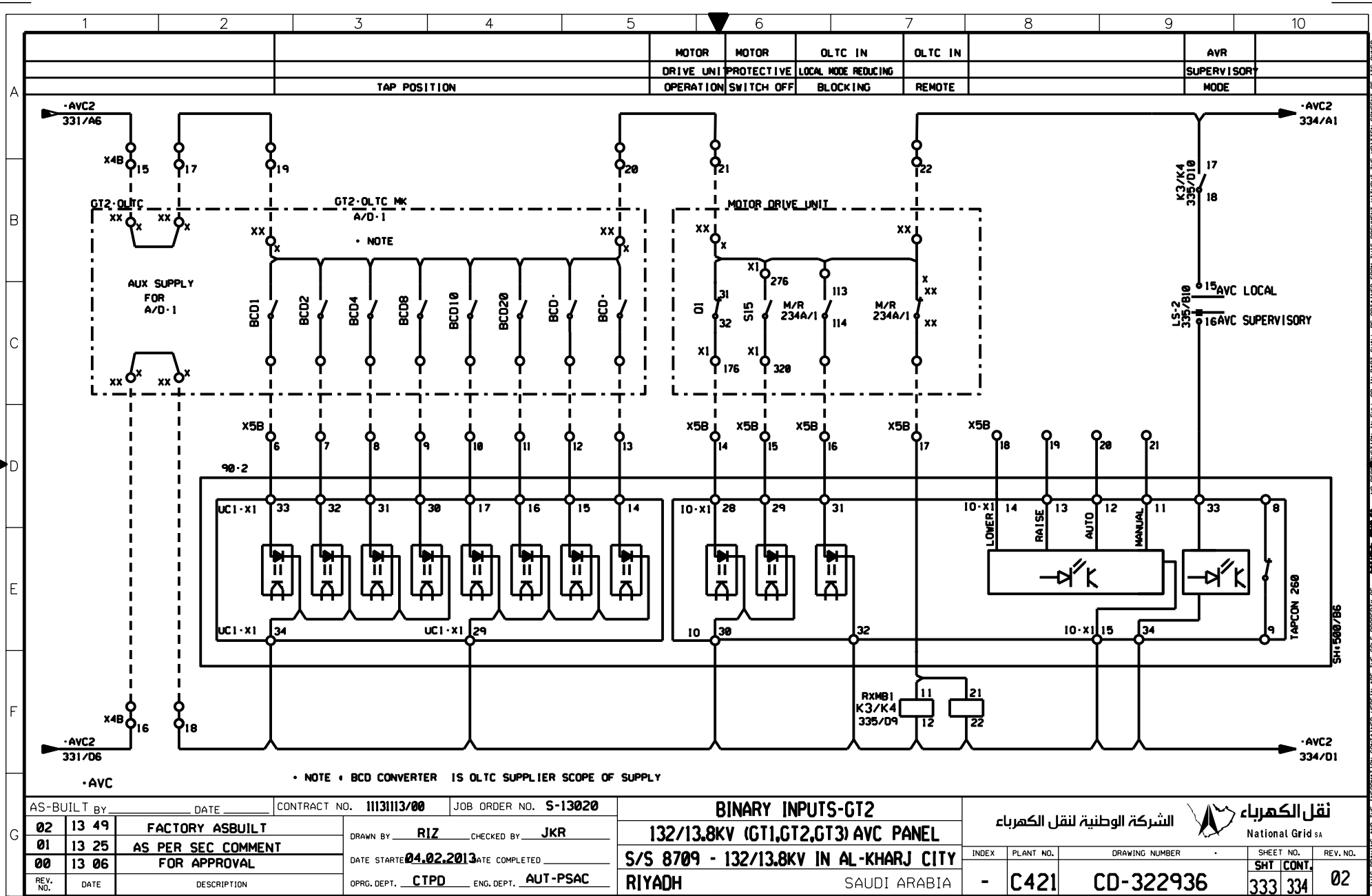
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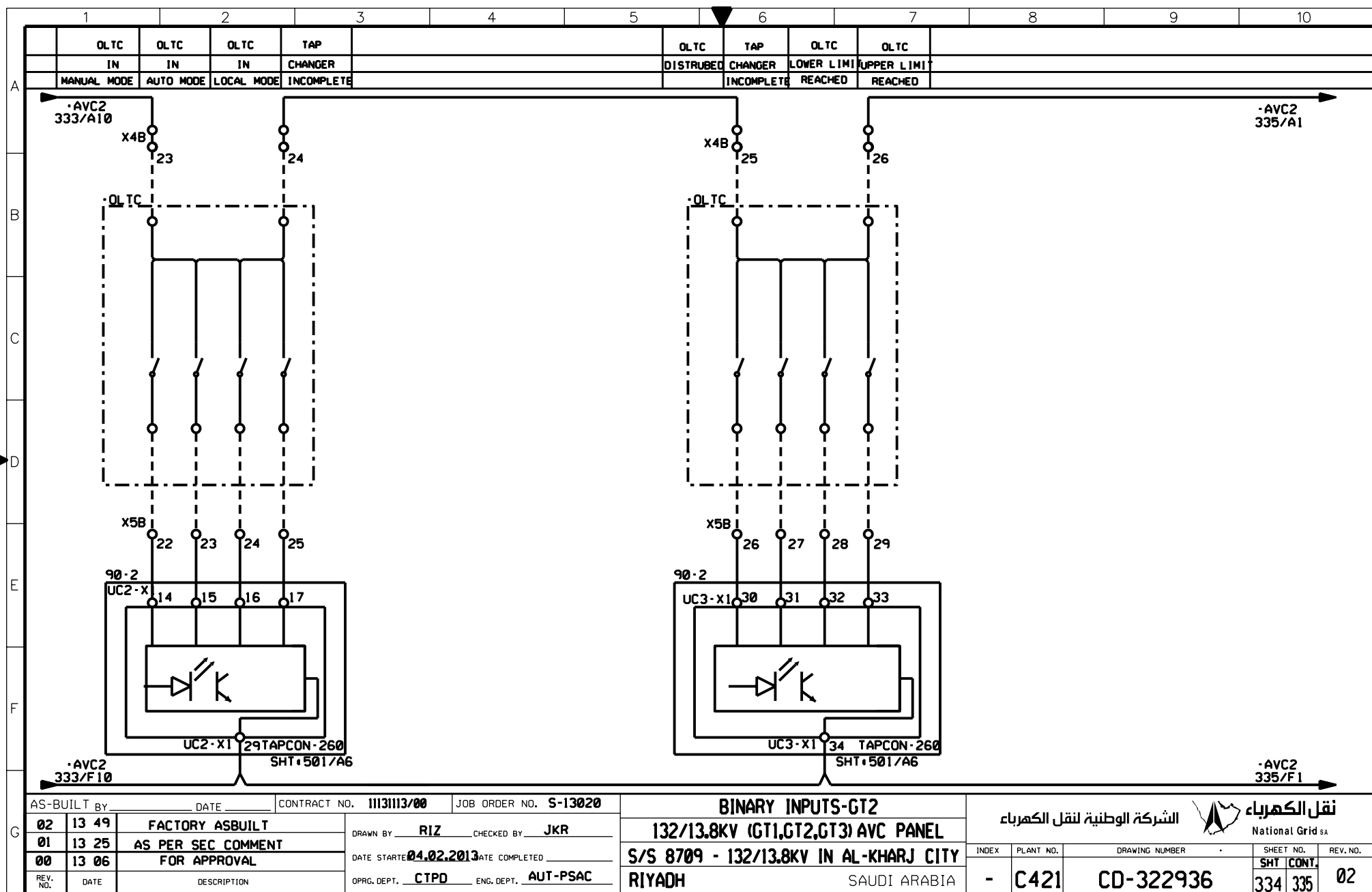


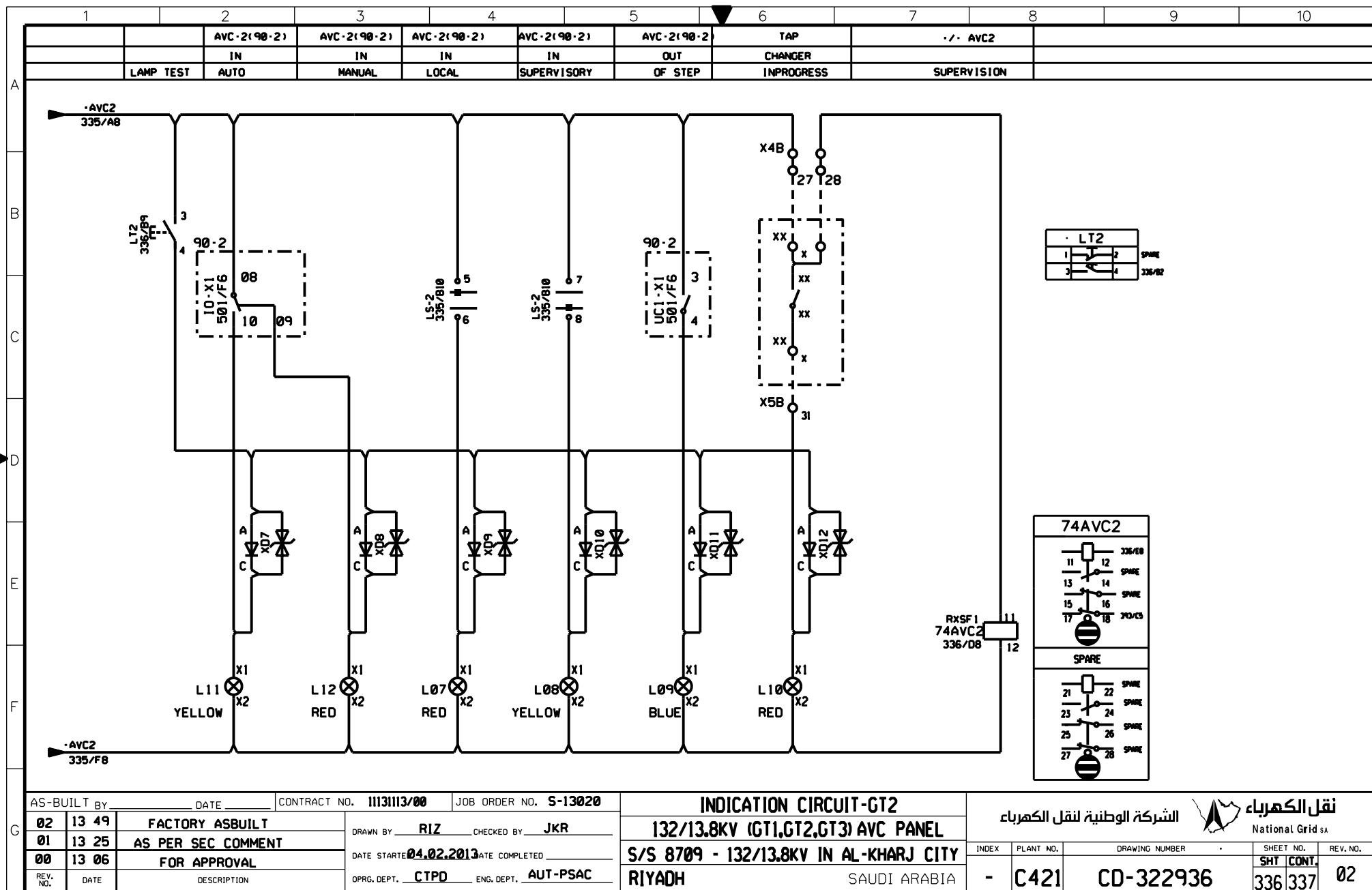
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DMS

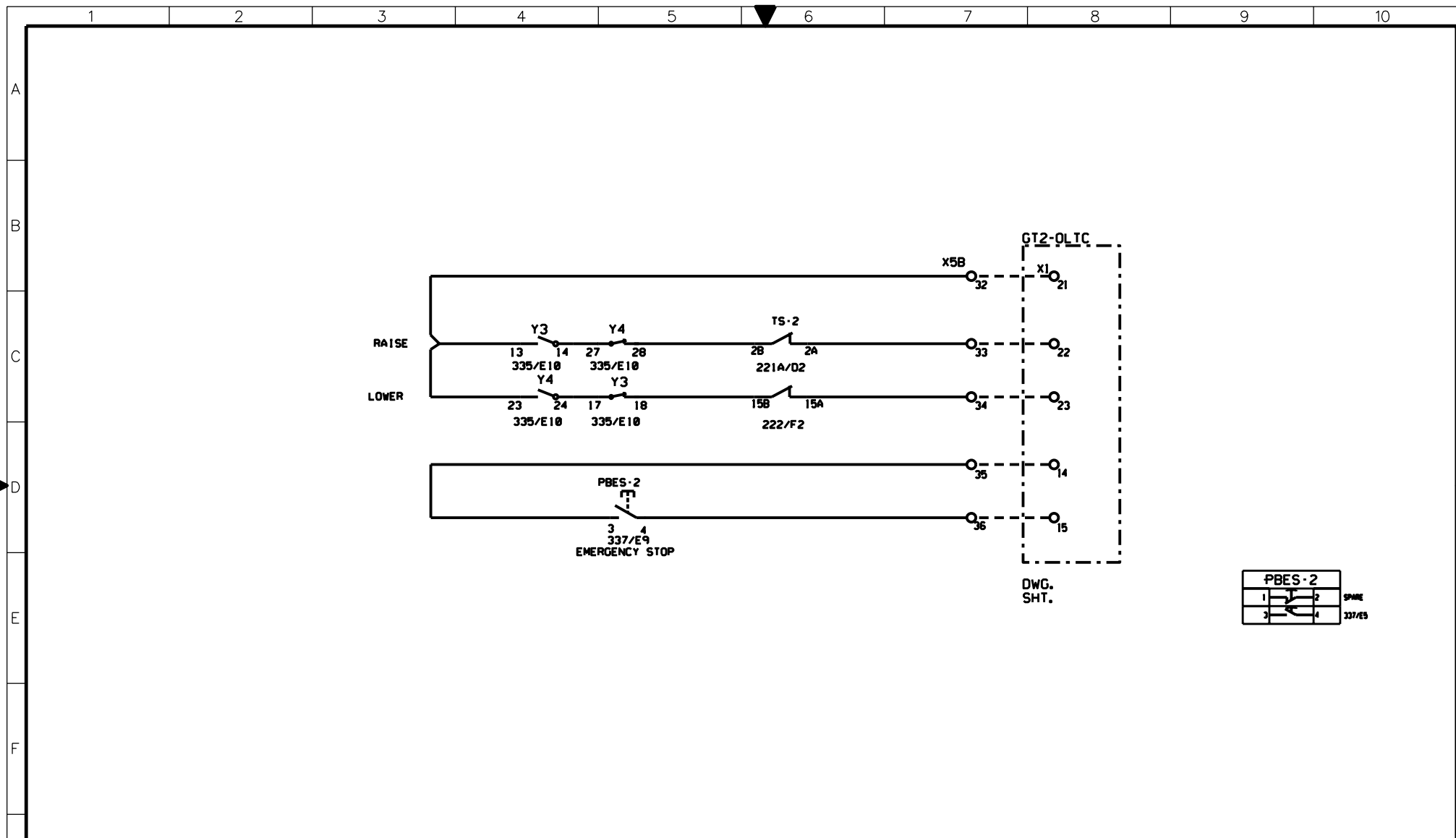
VECTOR

NGD200





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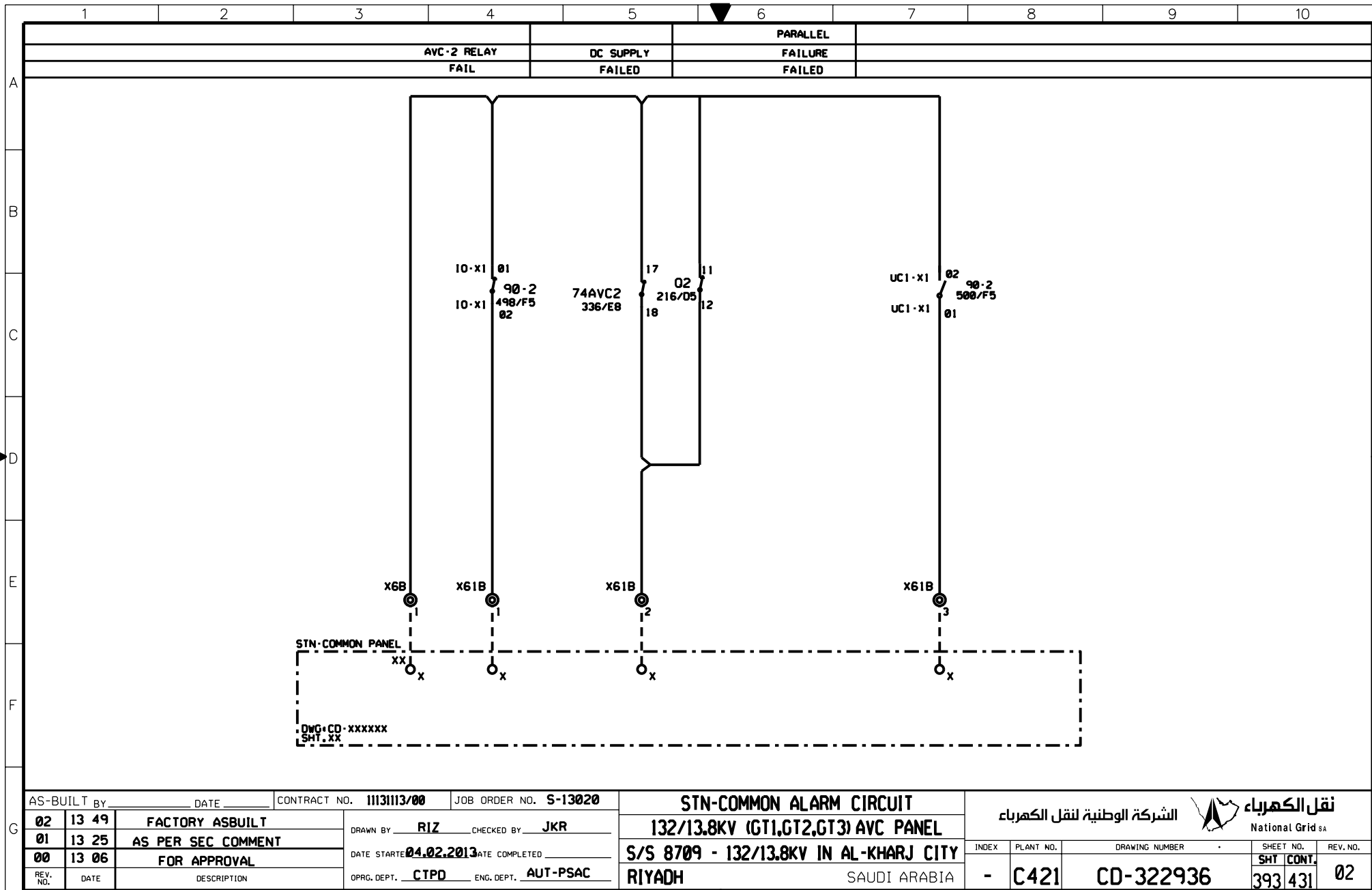
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REV. NO.	DATE	DESCRIPTION

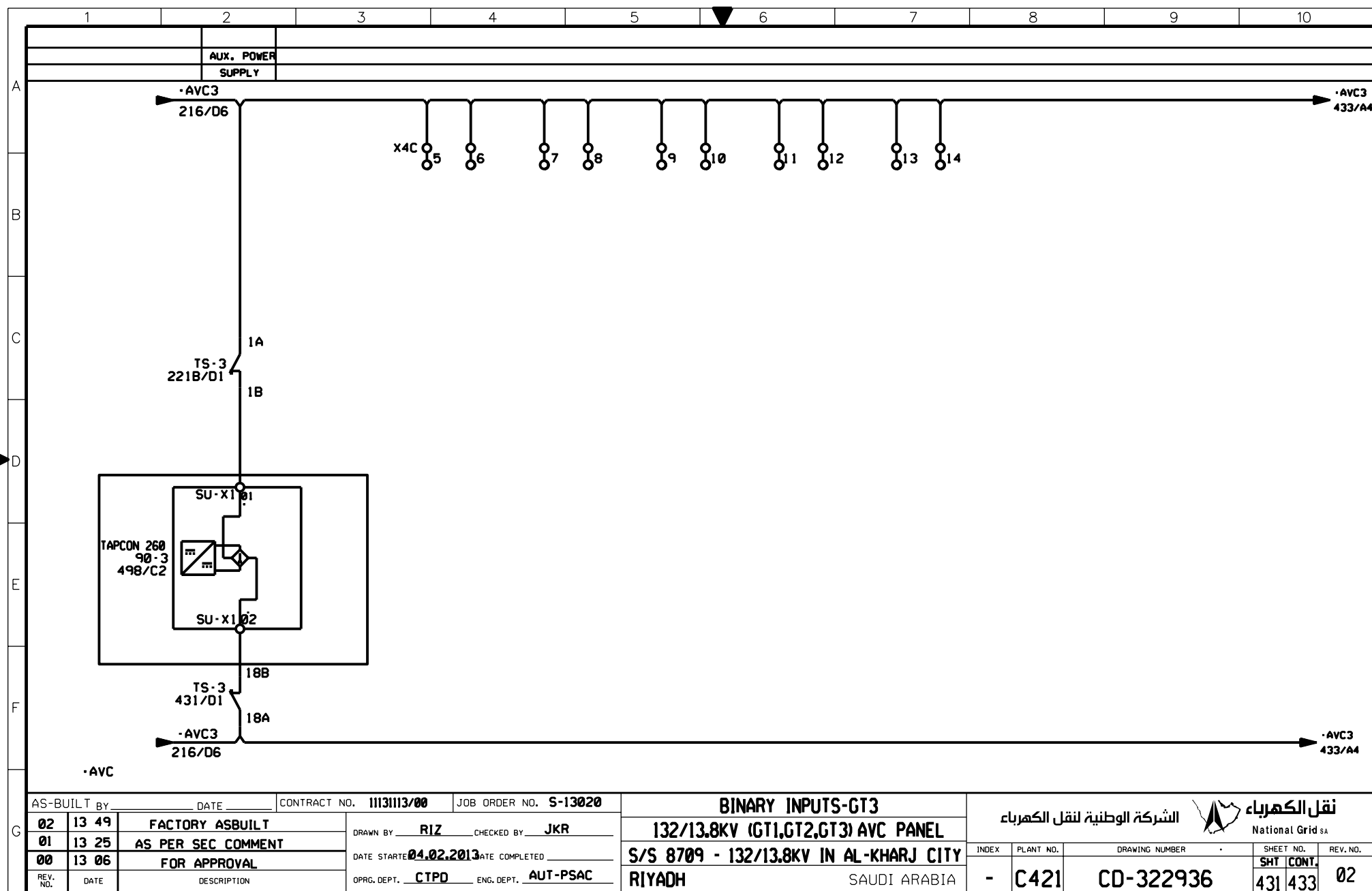
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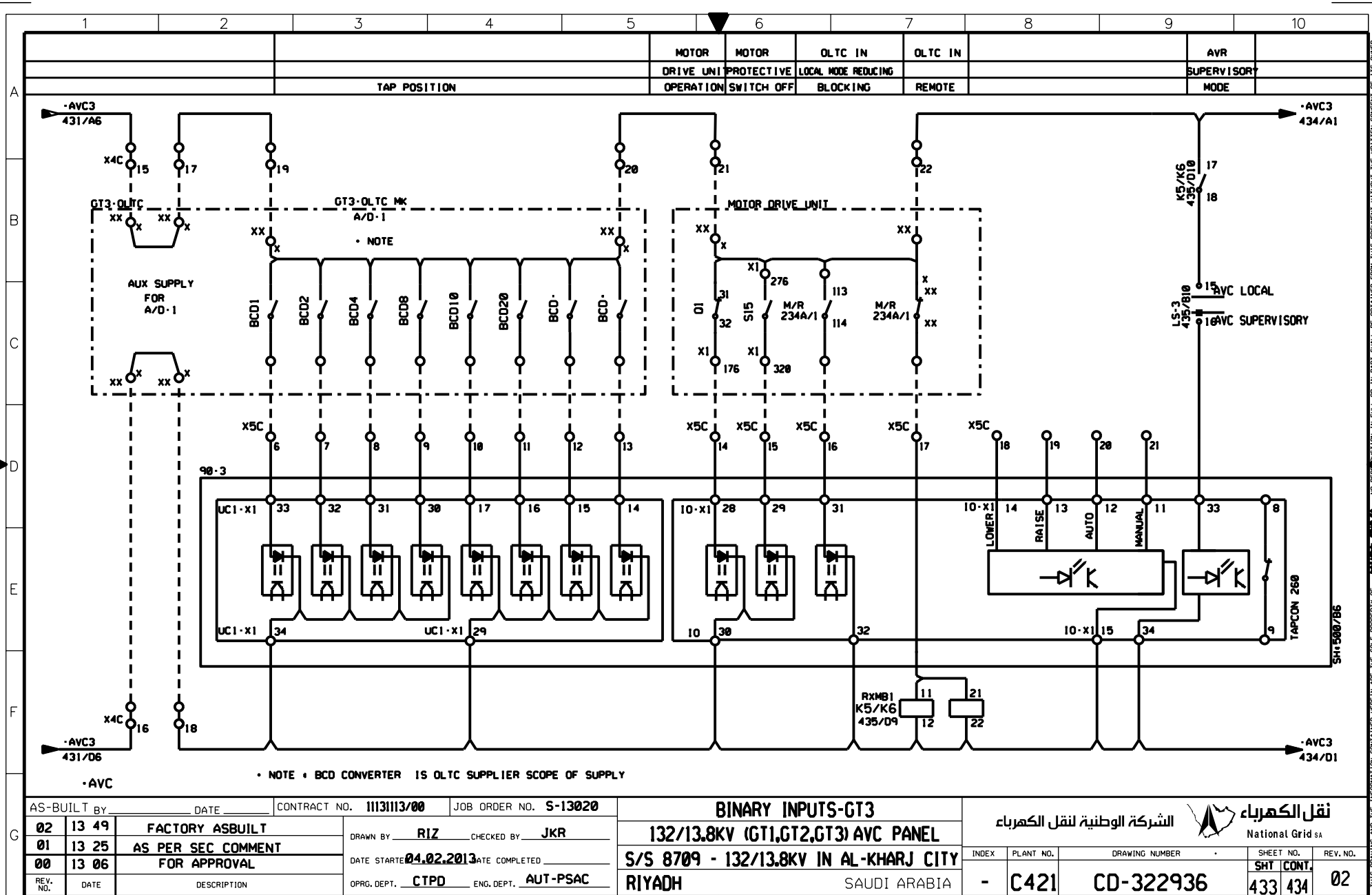
TAP CHANGER RAISE/LOWER CIRCUITS
132/13.8KV (GT1,GT2,GT3) AVC PANEL
S/S 8709 - 132/13.8KV IN AL-KHARJ CITY
RIYADH SAUDI ARABIA

الشركة الوطنية لنقل الكهرباء		نقل الكهرباء		National Grid sa	
INDEX	PLANT NO.	DRAWING NUMBER	SHEET NO.	REV. NO.	
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AS-BUILT BY _____ DATE _____ CONTRACT NO. **11131113/00** JOB ORDER NO. **S-13020**

02	13 49	FACTORY ASBUILT
01	13 25	AS PER SEC COMMENT
00	13 06	FOR APPROVAL

DRAWN BY **RIZ** CHECKED BY **JKR**

DATE STARTED **04.02.2013** DATE COMPLETED _____

PRG. DEPT. **CTPD** ENG. DEPT. **AUT-PSAC**

REV. NO.	DATE	DESCRIPTION
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BINARY INPUTS-GT3

132/13.8KV (GT1,GT2,GT3) AVC PANEL

S/S 8709 - 132/13.8KV IN AL-KHARJ CITY

RIYADH

SAUDI ARABIA

الشركة الوطنية لنقل الكهرباء
National Grid SA

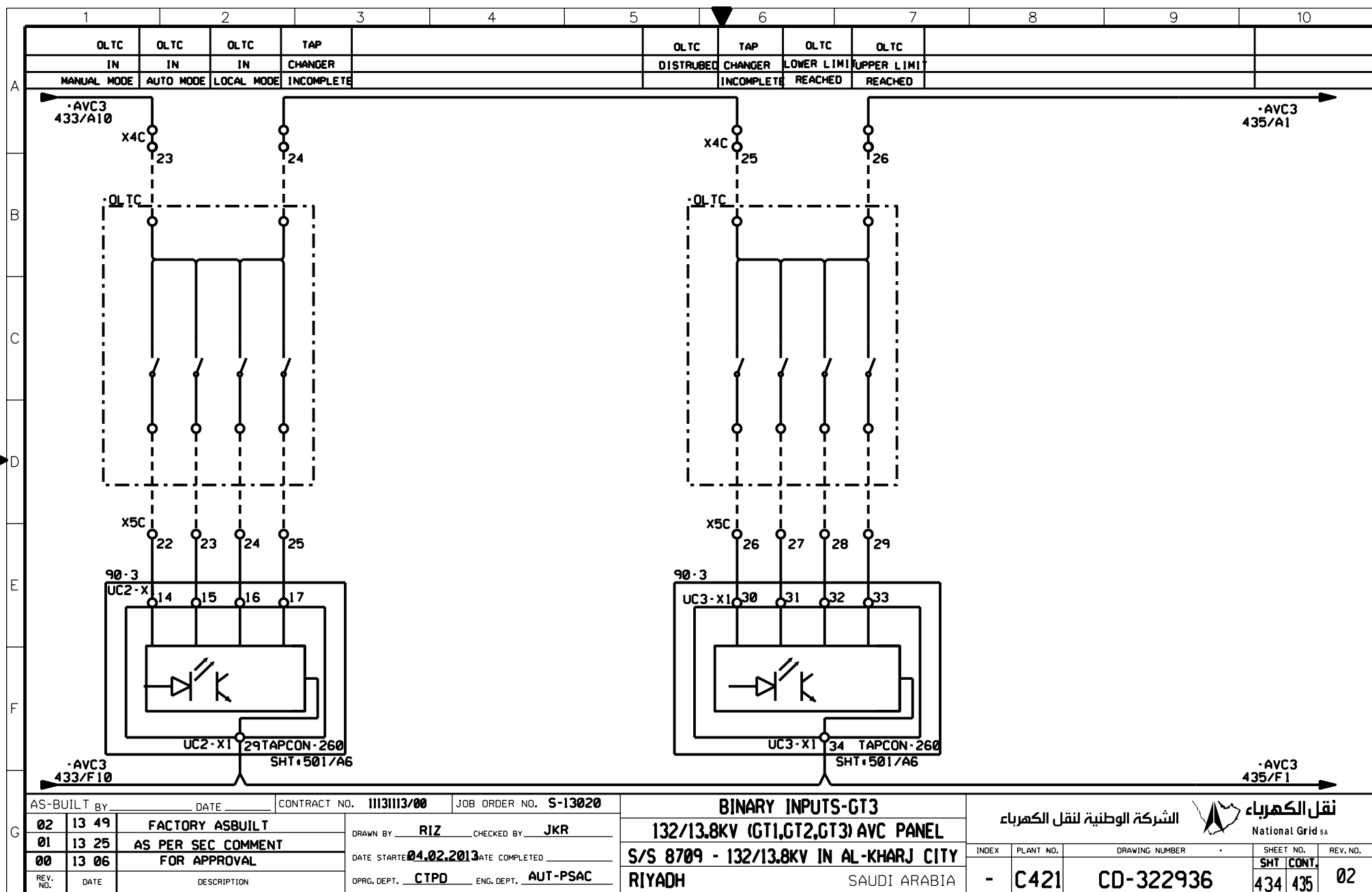
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NG/D2-D (2012/01)

DMS

VECTOR

NGD200



AS-BUILT BY _____ DATE _____ CONTRACT NO. **11131113/00** JOB ORDER NO. **S-13020**

02	13	49	FACTORY ASBUILT
01	13	25	AS PER SEC COMMENT
00	13	06	FOR APPROVAL

DRAWN BY **RIZ** CHECKED BY **JKR**

DATE STARTED **04.02.2013** DATE COMPLETED _____

OPRG. DEPT. **CTPD** ENG. DEPT. **AUT-PSAC**

REV. NO.	DATE	DESCRIPTION
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BINARY INPUTS-GT3

132/13.8KV (GT1,GT2,GT3) AVC PANEL

S/S 8709 - 132/13.8KV IN AL-KHARJ CITY

RIYADH

SAUDI ARABIA

الشركة الوطنية لنقل الكهرباء



National Grid SA

INDEX	PLANT NO.	DRAWING NUMBER	SHEET NO.	REV. NO.
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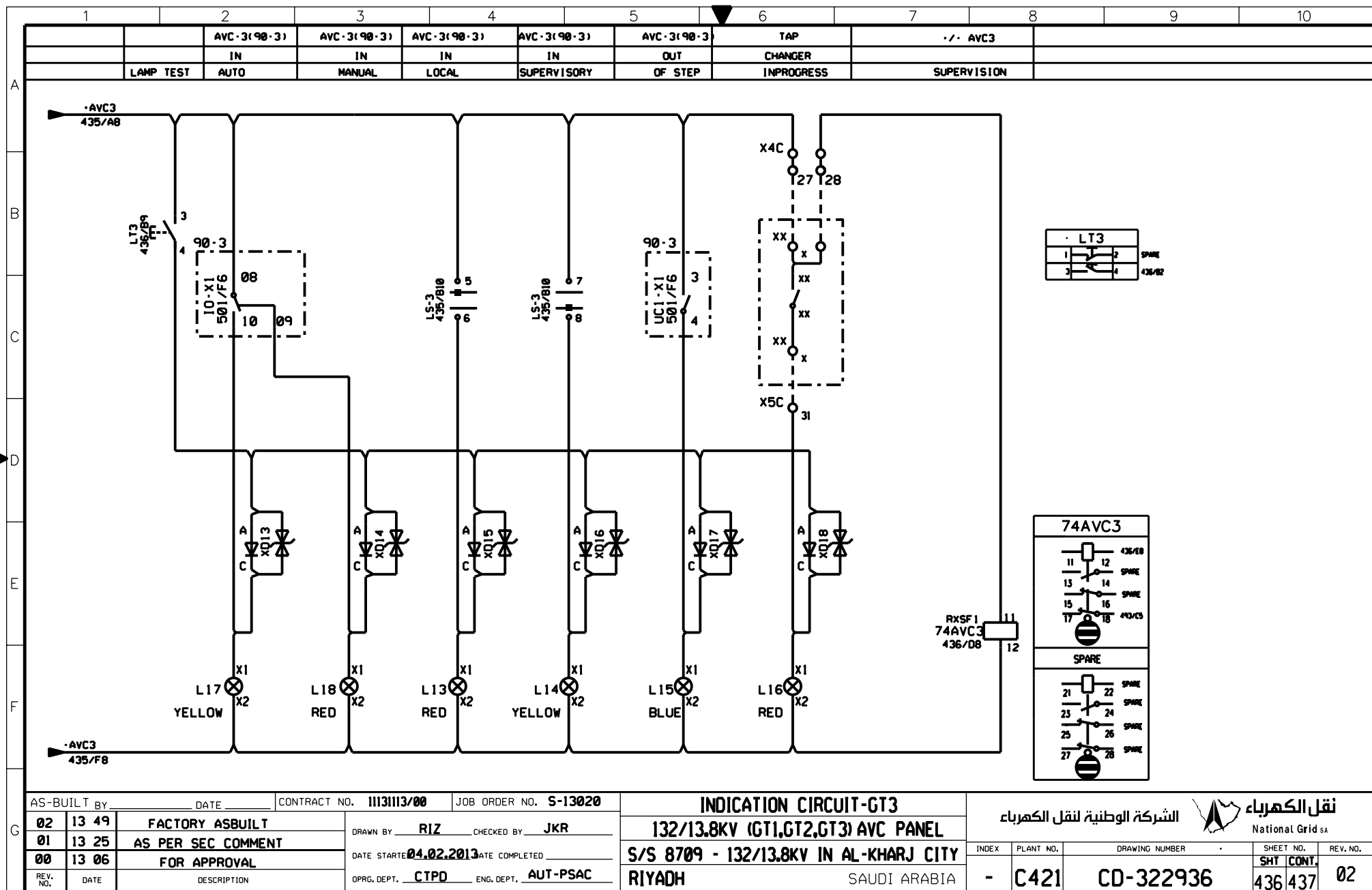
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VECTOR

NGD200

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AS-BUILT BY _____ DATE _____ CONTRACT NO. **11131113/00** JOB ORDER NO. **S-13020**

02	13 49	FACTORY ASBUILT
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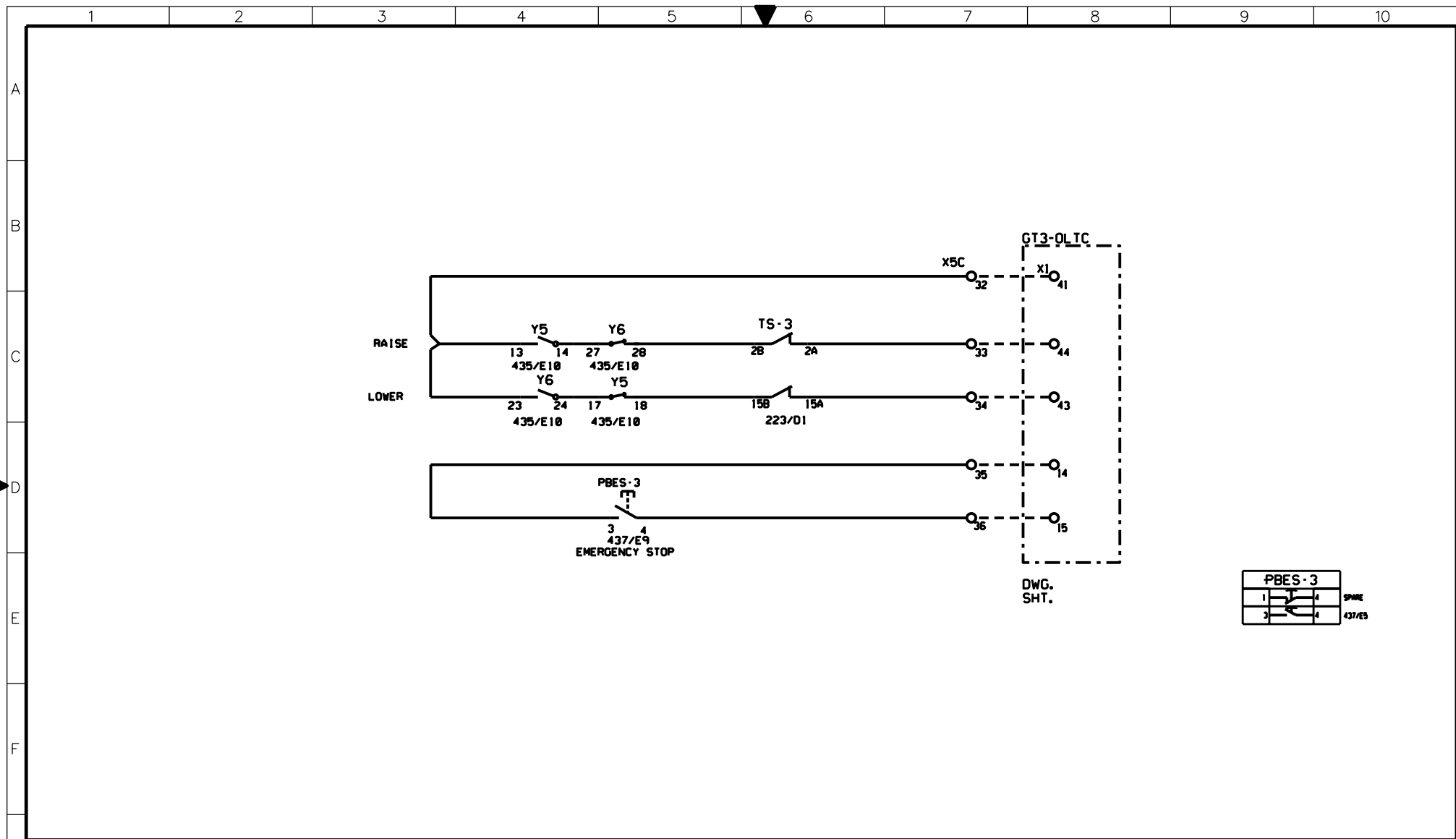
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 OPRG. DEPT. **CTPD** ENG. DEPT. **AUT-PSAC**

INDICATION CIRCUIT-GT3
132/13.8KV (GT1,GT2,GT3) AVC PANEL
S/S 8709 - 132/13.8KV IN AL-KHARJ CITY
RIYADH SAUDI ARABIA

الشركة الوطنية لنقل الكهرباء



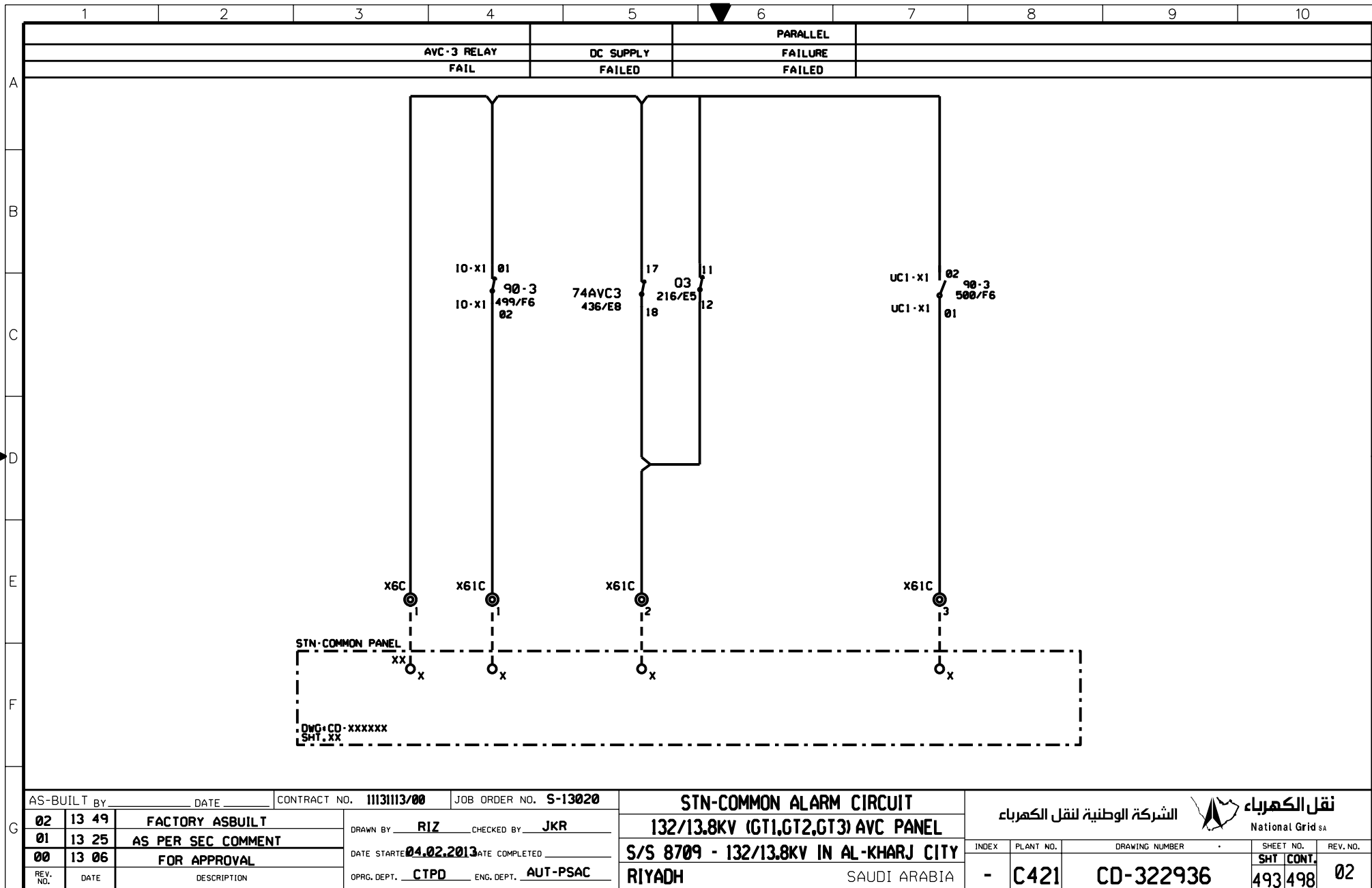
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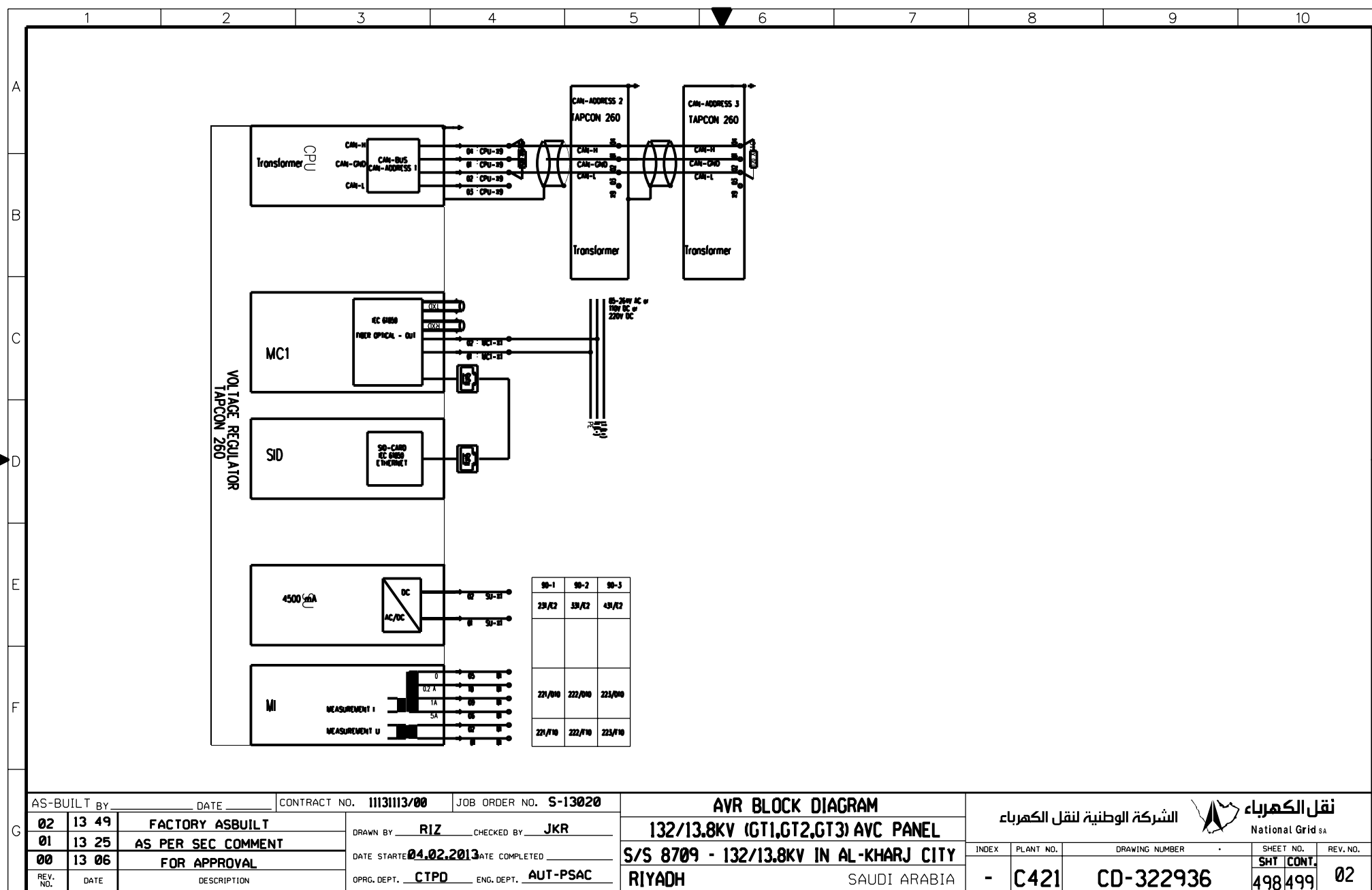
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01	13 25	AS PER SEC COMMENT	DATE STARTED 04.02.2013 DATE COMPLETED			
00	13 06	FOR APPROVAL	OPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC			
REV. NO.	DATE	DESCRIPTION				

TAP CHANGER RAISE/LOWER CIRCUITS	
132/13.8KV (GT1,GT2,GT3) AVC PANEL	
S/S 8709 - 132/13.8KV IN AL-KHARJ CITY	
RIYADH SAUDI ARABIA	

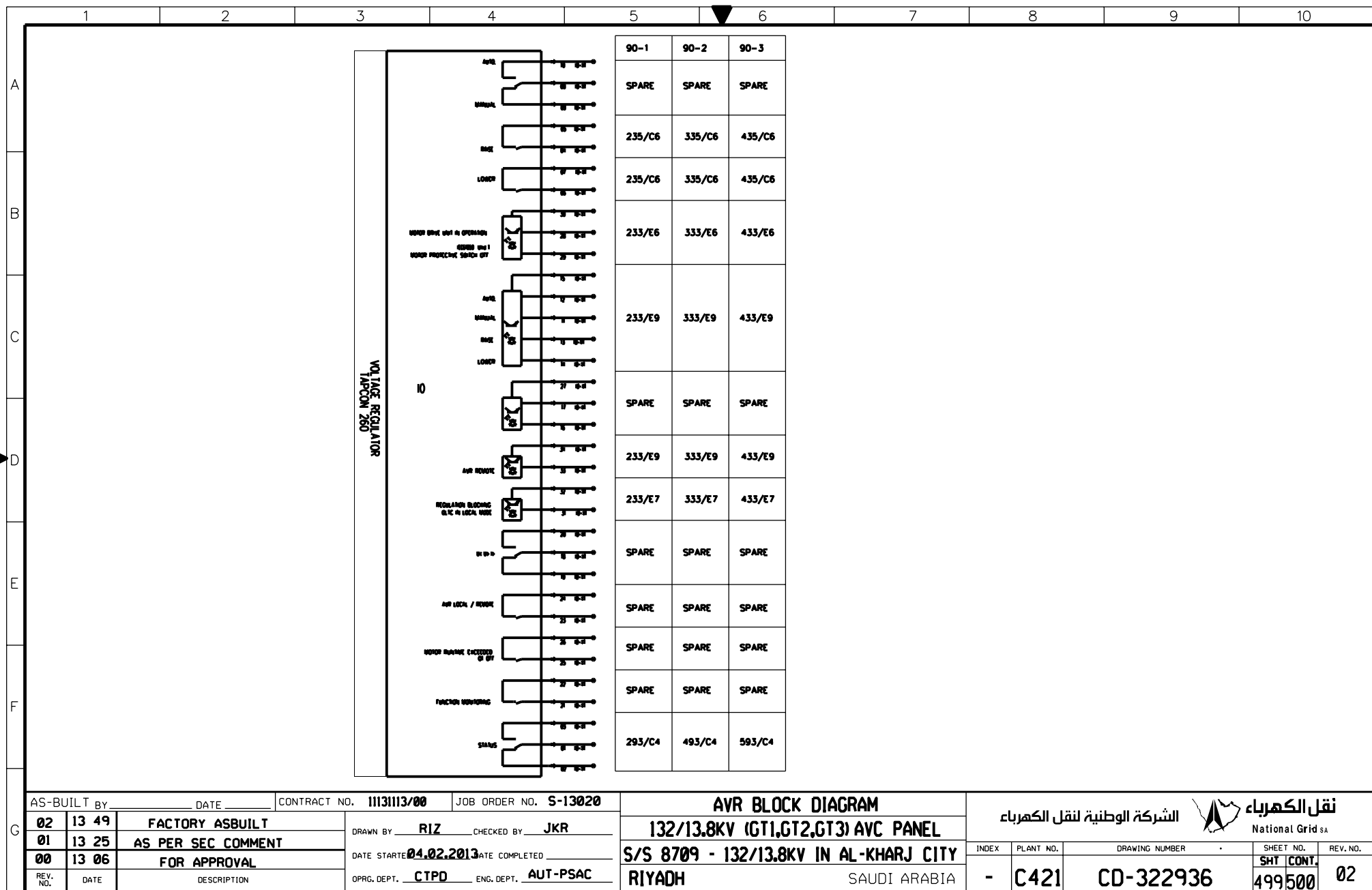
الشركة الوطنية لنقل الكهرباء		نقل الكهرباء		National Grid sa	
INDEX	PLANT NO.	DRAWING NUMBER	SHEET NO.	REV. NO.	
-	C421	CD-322936	437/493	02	



AS-BUILT BY _____ DATE _____			CONTRACT NO. 11131113/00		JOB ORDER NO. S-13020		<div>STN-COMMON ALARM CIRCUIT</div> <div>132/13.8KV (GT1,GT2,GT3) AVC PANEL</div> <div>S/S 8709 - 132/13.8KV IN AL-KHARJ CITY</div> <div>RIYADH SAUDI ARABIA</div>				<div>نقل الكهرباء</div> <div>الشركة الوطنية لنقل الكهرباء</div> <div></div> <div>National Grid SA</div>					
02	13 49	FACTORY ASBUILT	DRAWN BY RIZ		CHECKED BY JKR						INDEX	PLANT NO.	DRAWING NUMBER		SHEET NO.	REV. NO.
01	13 25	AS PER SEC COMMENT	DATE STARTED 04.02.2013		DATE COMPLETED _____						-	C421	CD-322936		SHT 493	CONT. 498
00	13 06	FOR APPROVAL	OPRG. DEPT. CTPD		ENG. DEPT. AUT-PSAC											02
REV. NO.	DATE	DESCRIPTION														



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AS-BUILT BY _____ DATE _____ CONTRACT NO. **11131113/00** JOB ORDER NO. **S-13020**

02	13 49	FACTORY ASBUILT
01	13 25	AS PER SEC COMMENT
00	13 06	FOR APPROVAL
REV. NO.	DATE	DESCRIPTION

DRAWN BY **RIZ** CHECKED BY **JKR**
 DATE STARTED **04.02.2013** DATE COMPLETED _____
 OPRG. DEPT. **CTPD** ENG. DEPT. **AUT-PSAC**

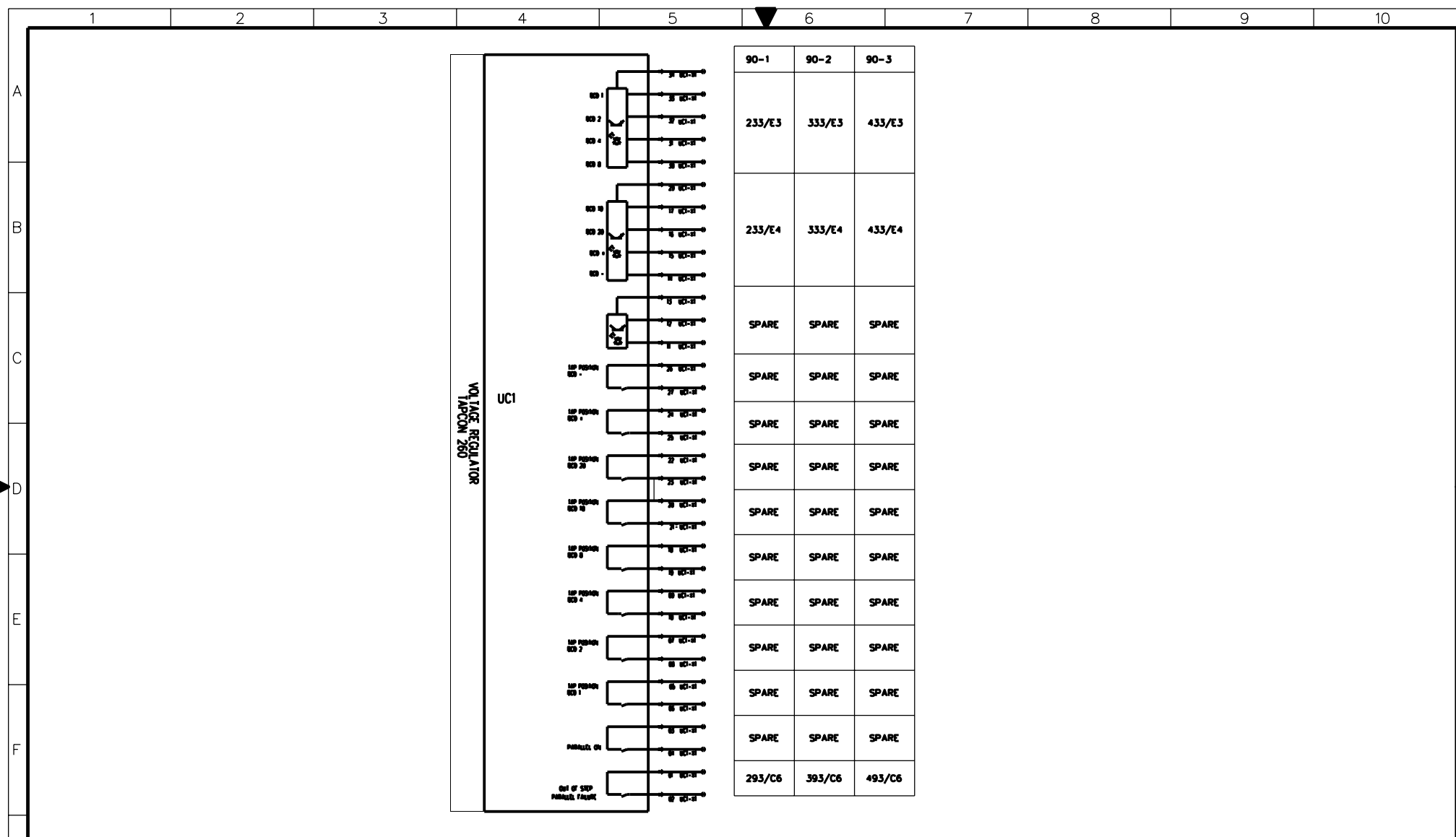
AVR BLOCK DIAGRAM

132/13.8KV (GT1,GT2,GT3) AVC PANEL
S/S 8709 - 132/13.8KV IN AL-KHARJ CITY
RIYADH SAUDI ARABIA

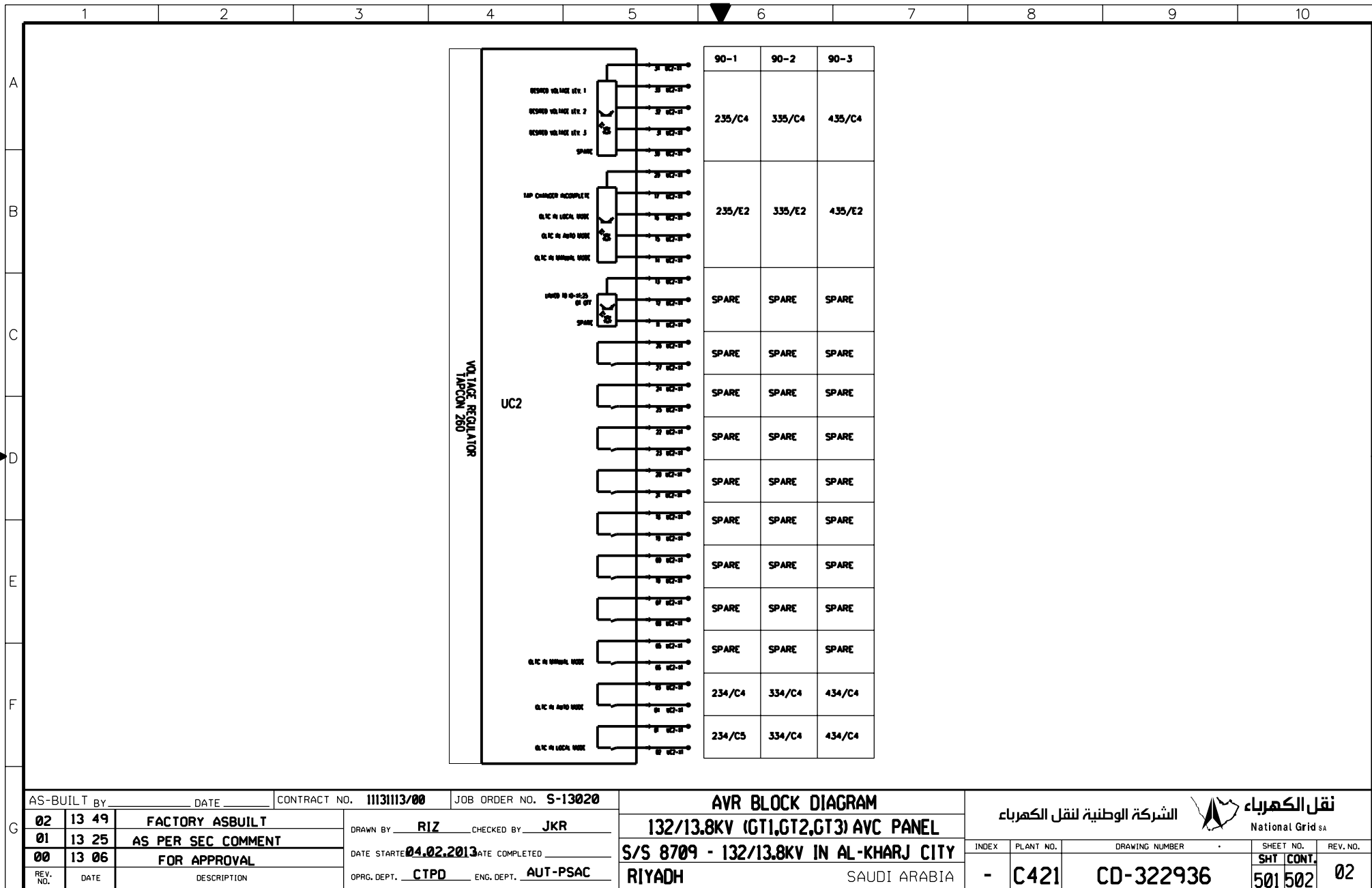
الشركة الوطنية لنقل الكهرباء



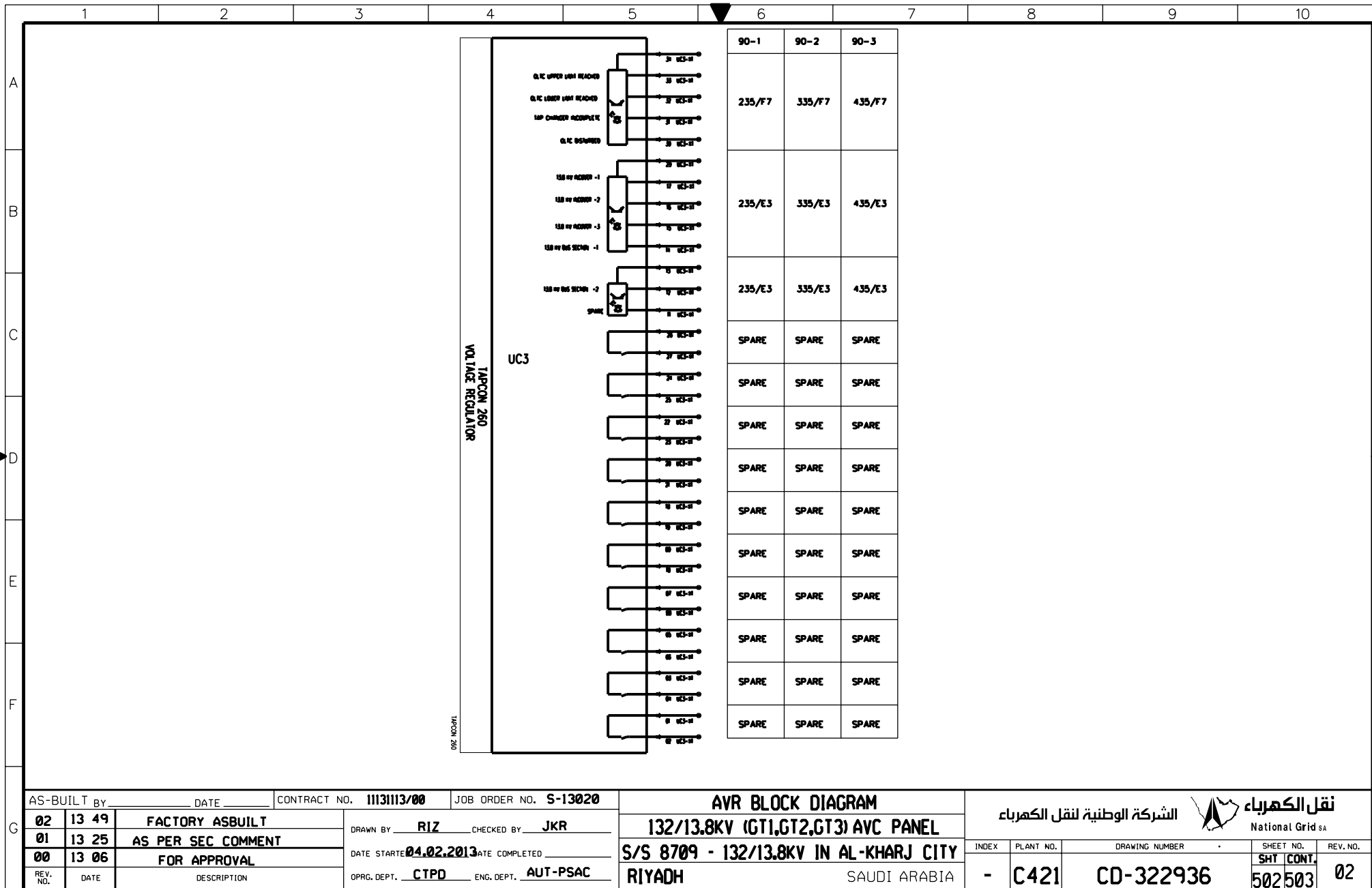
INDEX	PLANT NO.	DRAWING NUMBER	SHEET NO.	REV. NO.
-	C421	CD-322936	499500	02

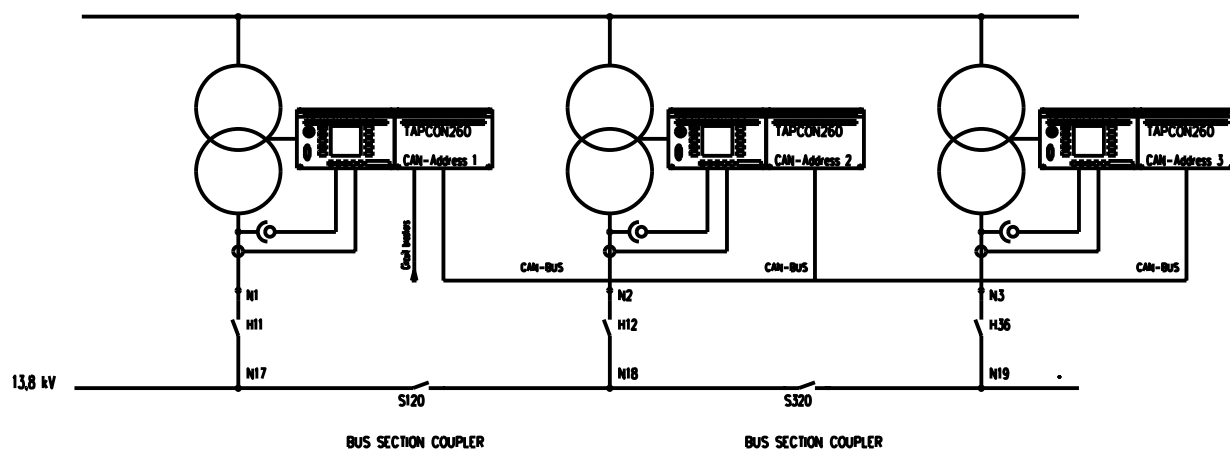


AS-BUILT BY _____ DATE _____		CONTRACT NO. 11131113/00	JOB ORDER NO. S-13020	AVR BLOCK DIAGRAM		نقل الكهرباء الشركة الوطنية لنقل الكهرباء National Grid sa	
02	13 49	FACTORY ASBUILT		132/13.8KV (GT1,GT2,GT3) AVC PANEL		INDEX	PLANT NO.
01	13 25	AS PER SEC COMMENT		S/S 8709 - 132/13.8KV IN AL-KHARJ CITY		DRAWING NUMBER	
00	13 06	FOR APPROVAL		RIYADH SAUDI ARABIA		CD-322936	
REV. NO.	DATE	DESCRIPTION		DATE STARTED 04.02.2013 DATE COMPLETED _____		SHEET NO.	
				OPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC		500/501	
						REV. NO.	
						02	



AS-BUILT BY _____ DATE _____		CONTRACT NO. 11131113/00	JOB ORDER NO. S-13020	AVR BLOCK DIAGRAM		نقل الكهرباء الشركة الوطنية لنقل الكهرباء National Grid sa				
02	13 49	FACTORY ASBUILT		DRAWN BY RIZ CHECKED BY JKR DATE STARTED 04.02.2013 DATE COMPLETED _____ OPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC		132/13.8KV (GT1,GT2,GT3) AVC PANEL S/S 8709 - 132/13.8KV IN AL-KHARJ CITY RIYADH SAUDI ARABIA				
01	13 25	AS PER SEC COMMENT								
00	13 06	FOR APPROVAL				INDEX	PLANT NO.	DRAWING NUMBER	SHEET NO.	REV. NO.
REV. NO.	DATE	DESCRIPTION				-	C421	CD-322936	501 502	02





AS-BUILT BY _____ DATE _____ CONTRACT NO. **11131113/00** JOB ORDER NO. **S-13020**

02	13 49	FACTORY ASBUILT
01	13 25	AS PER SEC COMMENT
00	13 06	FOR APPROVAL

DRAWN BY **RIZ** CHECKED BY **JKR**
 DATE STARTED **04.02.2013** DATE COMPLETED _____
 OPRG. DEPT. **CTPD** ENG. DEPT. **AUT-PSAC**

AVR TOPOLOGY

132/13.8KV (GT1,GT2,GT3) AVC PANEL
S/S 8709 - 132/13.8KV IN AL-KHARJ CITY
RIYADH SAUDI ARABIA

الشركة الوطنية لنقل الكهرباء



INDEX	PLANT NO.	DRAWING NUMBER	SHEET NO.	REV. NO.
-	C421	CD-322936	503504	02

NG/D2-D (2012/01)

DMS VECTOR NGD200

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<table><tr><td colspan="2">AS-BUILT BY _____ DATE _____</td><td colspan="2">CONTRACT NO. 11131113/00</td><td colspan="2">JOB ORDER NO. S-13020</td><td colspan="2">TERMINAL BLOCK REFERENCE</td><td colspan="3">الشركة الوطنية لنقل الكهرباء National Grid sa</td></tr><tr><td colspan="2">02 13 49</td><td colspan="2">FACTORY ASBUILT</td><td colspan="2">DRAWN BY RIZ CHECKED BY JKR</td><td colspan="2">132/13.8KV (GT1,GT2,GT3) AVC PANEL</td><td colspan="3">INDEX PLANT NO. DRAWING NUMBER SHEET NO. REV. NO.</td></tr><tr><td colspan="2">01 13 25</td><td colspan="2">AS PER SEC COMMENT</td><td colspan="2">DATE STARTED 04.02.2013 DATE COMPLETED _____</td><td colspan="2">S/S 8709 - 132/13.8KV IN AL-KHARJ CITY</td><td colspan="3">- C421 CD-322936 505 NIL 02</td></tr><tr><td colspan="2">00 13 06</td><td colspan="2">FOR APPROVAL</td><td colspan="2">OPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC</td><td colspan="2">RIYADH SAUDI ARABIA</td><td colspan="3"></td></tr><tr><td colspan="2">REV. NO.</td><td colspan="2">DATE</td><td colspan="2">DESCRIPTION</td><td colspan="2"></td><td colspan="3"></td></tr></table>											AS-BUILT BY _____ DATE _____		CONTRACT NO. 11131113/00		JOB ORDER NO. S-13020		TERMINAL BLOCK REFERENCE		الشركة الوطنية لنقل الكهرباء National Grid sa			02 13 49		FACTORY ASBUILT		DRAWN BY RIZ CHECKED BY JKR		132/13.8KV (GT1,GT2,GT3) AVC PANEL		INDEX PLANT NO. DRAWING NUMBER SHEET NO. REV. NO.			01 13 25		AS PER SEC COMMENT		DATE STARTED 04.02.2013 DATE COMPLETED _____		S/S 8709 - 132/13.8KV IN AL-KHARJ CITY		- C421 CD-322936 505 NIL 02			00 13 06		FOR APPROVAL		OPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC		RIYADH SAUDI ARABIA					REV. NO.		DATE		DESCRIPTION						
AS-BUILT BY _____ DATE _____		CONTRACT NO. 11131113/00		JOB ORDER NO. S-13020		TERMINAL BLOCK REFERENCE		الشركة الوطنية لنقل الكهرباء National Grid sa																																																									
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REV. NO.		DATE		DESCRIPTION																																																													

REFERENCE	X3 AC CKTS
211/A3	1 2 3 1
211/A7	2 2 2 2
211/A3	3 2 2 3
211/A7	4 2 2 4
211/B3	5 2 2 5
211/B7	6 2 2 6
211/B3	7 2 2 7
211/B7	8 2 2 8
SPARE	9 2 2 9
SPARE	10 2 2 10

REFERENCE	XD BLOCKING DIODE
234A/D4	1 2 3 1
234A/D4	2 2 2 2
334A/D4	3 2 2 3
334A/D4	4 2 2 4
434A/D4	5 2 2 5
434A/D4	6 2 2 6
SPARE	7 2 2 7

REFERENCE	XTJ TELEPHONE JACK
211/C3	1 2 3 1
211/C3	2 2 2 2
211/C3	3 2 2 3
211/D3	4 2 2 4
SPARE	5 2 2 5

REFERENCE	XSH SPACE HEATER
211/E6	1 2 3 1
211/F6	2 2 2 2
SPARE	3 2 2 3

REFERENCE	X6A ANNUAL CKTS
212/B5	1 2 3 1
212/B5	2 2 2 2
293/E3	3 2 2 3
SPARE	4 2 2 4

REFERENCE	X6B ANNUAL CKTS
303/E3	1 2 3 1
SPARE	2 2 2 2

REFERENCE	X6C ANNUAL CKTS
493/E3	1 2 3 1
SPARE	2 2 2 2